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MULTIPLE
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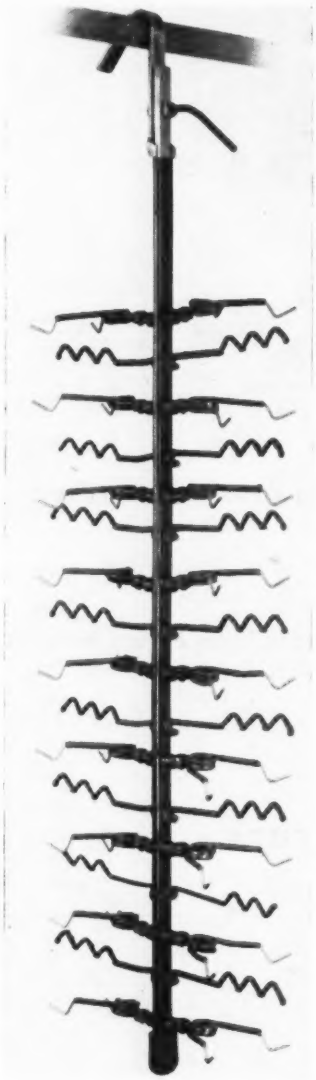

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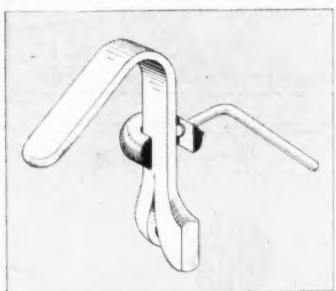

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VOL. 43, NO. 11 METAL FINISHING NOVEMBER, 1945
PREPARATION, ELECTROPLATING, COATING

More Than Just A Pay Check

Among those whose work brings them into contact with the technical and supervisory personnel of metal finishing departments and of the companies which furnish their supplies and equipment requirements it will be generally agreed that the job turnover among such personnel has been much greater than in previous years. Although the reasons vary widely with individual cases, the most common one, so far as we can determine, seems to have been dissatisfaction with the salary received.

It was not uncommon, while the war was on, for some workers in a department to earn a larger income than the foreman or supervisor because the latter, a salaried employee, did not receive overtime premium pay. Wage stabilization rules made it difficult to obtain more than limited relief for the salaried man, the result being that the more attractive salaries offered by companies with higher wage ceilings tempted many men away from jobs they had held for years.

In the near future we will undoubtedly be confronted with the discontinuance of the finishing departments in a large number of plants where such units were installed ostensibly for war production, but frequently with the hope that they might find some peacetime use. The technical and supervisory personnel of such departments will then be in the market for new employment opportunities.

Although the factors which determine the desirability of a job would seem to be obvious, the recent frequency of employment changes would seem to indicate that these factors have not been considered seriously. Salary is not the only consideration, even from a strictly financial standpoint. Almost as important are employment stability, sick leave, pension plans, insurance and similar factors. Other considerations are the attitudes of the company and the employees, working conditions and the company's future prospects, to name but a few. When considering offers, all these factors which determine the economic status of a job should be examined. The job with the lower salary may often turn out to be the more desirable one.

Pearl Harbor's Metal Spraying School

By GEORGE W. GRUPP

Navy War Correspondent

AFTER the Japanese attack on Pearl Harbor there developed immediately a great demand for skilled technicians for, among other things, the United States Navy recognized the value of metal spraying as an effective way to retard corrosion, as a quick way to repair and extend the life of damaged and worn parts, and as a solution to the problem of a possible insufficient supply of new parts.

Unfortunately, the Navy had some difficulty in getting for Pearl Harbor Navy Yard service men who were skilled in the art of spraying atomized molten metal upon a surface to produce a metallic coating for protective and mechanical purposes. Practically all of the skilled metal sprayers were in the service of the war production industries in continental United States. As a result, to meet the need for metal sprayers in the Pearl Harbor Navy Yard a school was established to train unskilled labor into skilled metal sprayers.

At this school untrained civilians who pass a civil service general intelligence test are given an opportunity to learn a trade. First they are put to work in the Navy's metal spraying shop. A few days later they are required to pass a written test, an oral test, and an adaptability test before they are admitted into the school.

Now, since these tests are not easy, only about 20 per cent of the applicants make the grade of admission. This is due, as might be suspected, to the school's high standards. And to attain its objective to turn out the best possible metal sprayers, the instructors who are practical and technically trained men, quickly weed out those students admitted, who show any signs of lacking metal spraying adaptability, with the recommendation that they pursue some other apprenticeship training course to which they are better suited, for no talent is wasted if a place can be found to use it.

All students, if they are not weeded out after admission, are given a thirty days' intensive course in metal spraying. Under the guidance of instructors, five hours each day are devoted to actual practice in the school or in the Navy Yard's metal spraying shop; and three hours of the day are given over to classroom demonstrations, recitations and lectures on subjects which range from an introduction of a proper metal spraying installation to that of spraying, from lighting the gun to spraying speeds, from the complete procedure for a metal spraying job to the making of the complete job, from the setting up of the mechanism to mechanical troubles, from the spraying of flat surfaces to the spraying of inside diameters, from a discussion on blow holes, defects and cracks to the advantage of porosity on bearing surfaces, from an explanation of wire feed mechanism to an exposition of gas head assembly.

At the very beginning of the course the students are taught the importance of surface preparation before spraying. They are told to clean the surface with carbon tetrachloride or trichlorethylene; and they are instructed to observe carefully that the surface is free from oil and moisture to prevent oxidation. More than that, since the adhesion of a sprayed metal coating is influenced by the form of surface, they are therefore instructed in ways to roughen smooth surfaces by steel grit and sand blasting.

To avoid unnecessary delays in case the metal spraying mechanism breaks down, the students are instructed in the causes and remedies for such mechanical troubles as (a) the extinction of the flame upon opening the valve; (b) the extinction of the flame during spraying; (c) the stoppage of the wire feed; (d) the improper speed of wire feed, and (e) the improper flow of metal spray from the gun.

One might now ask: What are some of the specific methods taught on preparing surfaces, deposit thickness, and metals used for spraying?

Within the compass of this article it is impossible to set forth all details and only some of the highlights will therefore be presented here.

Methods Taught

Round (beach) sand is never used in preparing the surface to be sprayed. If the sand is too fine, the surface is not properly roughened. The sand must be of the dry, hard silica or flint, angular washed type from 16 to 20 mesh in size.

Whenever possible steel grit is used, but it must be free from dust and foreign material to produce satisfactory results. Grit No.

Official U. S. Navy Photograph

Instructor shows a student the proper way to hold a gun in metal spraying of a cylinder.

20 produces the best results in roughening the surface of Diesel engine cylinder liners and crankshaft bearings. Grit No. 30 is used for such parts as rolls, shafts, and press fits which are coated with bronze, copper, Monel, nickel and stainless steel. Grit No. 40 is used to prepare surfaces to be coated with aluminum, cadmium, lead, and zinc.

It is Navy practice to spray the surface of the part as soon as possible after the surface has been prepared because of highly destructive corrosive agencies which are present in the Pacific regions.

Most flat surfaces and tank work are sprayed with aluminum, cadmium, lead, tin and zinc as protection against corrosion. Bronze, copper, Monel, and stainless steel are not generally used on flat surfaces because of the thickness required and the necessary grinding. If more than one coat is applied to a base, a stiff wire brush is used after each coat to eliminate oxide.

Under certain conditions final lead coatings are treated with lastincote. This is done to give sulphates a chance to form before acids come into contact with the coatings.

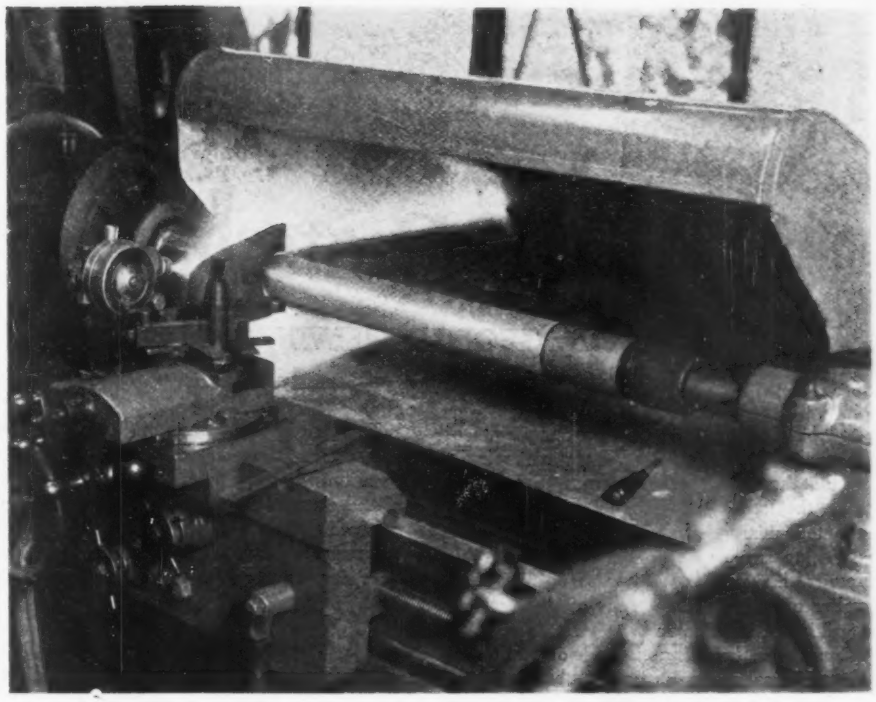
When sprayed aluminum coatings are to be heat treated they are coated with silcate of soda to help hold the aluminum on the surface until the steel has absorbed the aluminum.

Aluminum is generally sprayed on iron and steel products. The thickness of the coating depends upon the product and its use. For resistance against high temperatures the coating is from 0.006 to 0.008 inch thick; for ordinary atmospheric corrosion resistance the coating is from 0.010 to 0.012 inch thick; for corrosion resistance against food products, fresh water, vegetable oils, and salt water atmosphere the coating is from 0.012 to 0.015 inch thick; for corrosion resistance against mild acid solutions, mineral and crude oils, and refined oil products the coating is from 0.015 to 0.020 inch thick, and to create a reflective surface on glass the coating is from 0.008 to 0.010 inch thick.

Copper and its alloys, such as brass and bronze, are used to coat iron, steel, wood, paper, plaster and other non-metallic bases. Before they are sprayed on iron and steel bases, both of these metals are first sprayed with a coat of zinc. In using these non-ferrous metals to retard corrosion, the coating is from 0.030 to 0.040 inch thick. When they are used to build up undersized or worn bearing or slide surfaces, or to fill in defects, the thickness varies with the requirements. In spraying them on carbon resistors and brushes the coating is from 0.003 to 0.006 inch thick; and when used to surface electrical contacts and shoes the coating is from 0.008 to 0.010 inch thick.

Cadmium is used mostly to coat iron and steel. To retard corrosion against salt water atmosphere the coating is from 0.008 to 0.010 inch thick; for corrosion resistance against sea water, brine solutions, refined oil products, alkaline solutions, mild acid solutions, and mineral and crude oils the coating is from 0.010 to 0.012 inch thick.

Before iron and steel bases are sprayed with the same metals they are first coated with zinc. Iron and steel products are usually sprayed to the required thickness to fill in defects and to build up worn and undersized slide and bearing surfaces.



Official U. S. Navy Photograph

Mechanical metal spraying of a shaft.

Lead is sometimes used to coat copper, iron, and steel products. For corrosion resistance against atmospheres with high humidity, excessive amounts of carbon dioxide and sulphur dioxide the base is coated with lead from 0.030 to 0.040 inch thick; as resistance against attacks from brine solutions, mild acid solutions, and sea water the lead coating on the bases is from 0.020 to 0.030 inch thick; and for resistance against salt water atmosphere the coating is from 0.015 to 0.020 inch thick.

Monel, Nichrome, nickel and its alloys are used to spray iron and steel products, but before doing so they are first given a preliminary coating of zinc. Worn and undersized slide or bearing surfaces are built up with these non-ferrous metals to the required thickness. As an ordinary corrosion preventive the coating of these non-ferrous metals is from 0.030 to 0.040 inch thick.

Tin is often used to coat products made of iron, steel, copper, and non-ferrous alloys. For protection against mild acid solutions, vegetable oils, and food products the bases are sprayed with a coating of tin from 0.020 to 0.030 inch thick.

Zinc is used on any properly prepared base. To retard corrosion in an ordinary atmosphere the bases are sprayed with a coating of zinc from 0.008 to 0.010 inch thick; for corrosion resistance against food products, fresh water, salt water atmosphere, and vegetable oils the bases are coated with zinc from 0.010 to 0.012 inch thick; for corrosion resistance against brine solutions, mineral and crude oils, refined oil products, mild acid solutions and immersion in salt water the zinc coating is from 0.012 to 0.015 inch thick; and for resistance against any abnormal corrosion condition the zinc coating is from 0.020 to 0.025 inch thick.

Heavy metal spray coatings on shafts, or similar surfaces, are produced by having the air jet play on the under side of the shaft as the coating is being applied on the top side. As a result the metal cools as it is applied and the shrinkage is reduced to a minimum.

To fill in blow holes and defects in castings the spots are first chiseled out and the edges are undercut. Before spraying the spots, they are first steel grit blasted. In the case of cracks, they are first opened with a chisel and dovetailed. Sometimes a small hole is drilled at each end of the crack to keep it from progressing further. Naturally, all of this is done before steel grit blasting and spraying.

When it is necessary to eliminate the porosity of a sprayed surface one of three methods are used. First, the pores are sealed by applying a heavy coating in successive thin layers. Second, the surface pores may be eliminated by mechanically working the metal. Cadmium, lead, and tin are sealed by wire brushings, but copper and copper alloys and steel are ground and polished. And third, the pores of surface metal are sealed with a chemical solution or material.

Machine parts which are metal sprayed are finished by wet grinding which is considered the best method, or by dry grinding, or by machining if either grinding method is impractical.

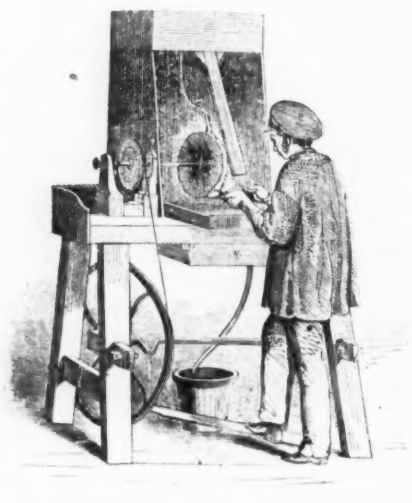
In the Navy's Pearl Harbor school, whose methods were briefly described here, metal sprayers have been trained who fill a need to help promote the best interests of the United States Pacific Fleet in its battle against the Japanese.

All Our Yesterdays

By GEORGE SPELVIN

ONE of the most common complaints of the practicing scientist or technologist is that he cannot find the time to keep up with the latest developments, as reported in the technical press, and still get any work done; to say nothing of having time for his family, his friends, and the Tuesday night poker club. It is simply out of the question for him to indulge in that most fascinating of pastimes, browsing through old issues of the technical journals. So it is that your correspondent has volunteered to do that for you and to try to report, with a minimum of comment, such tid-bits as he finds which seem to be amusing or instructive.

There are many satisfactions to be gained by calling up the past in this way. The thrill of recognition—finding something now taken for granted being introduced as a new discovery—is familiar to any delver into old literature. It goes without saying that any serious worker is interested, to a greater or less extent, in the history of his profession. Finally, the modern reader cannot suppress at times a sense of superiority which comes of the knowledge that many of the ideas seriously propounded in the literature have, in the intervening years, blown up with a loud bang. This reaction is harmless enough if the reader of today will retain an humble spirit: for though some of the old literature may seem laughable, it must always be remembered that we can see farther than our predecessors because we are standing on their shoulders and have profited by their mistakes. In 1990 it will be the plater of 1945 who will be an old-timer.



This brief glimpse into the byways of the past, then, is by no means intended as an occasion for snickers either at the expense of the platers themselves or the various journals which reported their activities. If you are tempted now and then to guffaw, consider how funny you—and I—will look in 1990.

As a starting point for our browsing it seemed well to choose the years 1902-03, for several reasons. That period marked the founding of several magazines devoted to electrochemistry and the allied arts and sciences: *Metal Industry* (now *Metal Finishing*) and *Electrochemical Industry* (now *Chemical and Metallurgical Engineering*), and the first volumes of the *Transactions* of two important societies: *The Electrochemical Society* and the *Faraday Society*. The founding of the American Electroplaters' Society was still six years in the future. And we shall miss the actual turn of the century by only a year or so.

On the national scene an almost contemporary touch was afforded by the presence of a Roosevelt in the White House; all during 1903 a serious business depression led to an outbreak of strikes and riots and the imposition of martial law at various times and places.

The year marked the negotiations with Colombia over the Panama Canal which ended with TR's instigation of the Panamanian Revolution and the beginnings of a new Central American republic. If was the year of one of the worst fires in our history, at the Iroquois Theatre in Chicago, which cost 588 lives. The Wright brothers made history at Kitty Hawk, N. C., when they stayed in the air 59 seconds. The first Pacific cable was completed; the first automobile to cross the continent under its own power made headlines. Truly the new century gave promise of great things to come. And what were the electrochemists and platers doing? *

Item: Dr. Schultz advises us that he is experimenting on electrolytically plating sheet iron with aluminum. Dr. Schultz's plan is to replace tinplate. He says that tinplate manufacturers cannot put on less than about 2.5% of tin with their present process while for many if not most uses a thinner coating of tin would be sufficient. He says he can put on electrolytically as small an amount of metal as desired and that aluminum would be preferable to tin.

Here's an objection to the use of a newly coined word: *electrogalvanizing*. It is objected—logically enough—that both halves of the word mean the same thing. (And so they do, now I come to think of it.)

An editorial warns platers to be wary of adulterated potassium cyanide: some brands of this product contain large amounts of sodium cyanide and even sodium chloride: one sample contained no potassium at all! The unwary plater, it appears, might be paying potash prices for soda under these conditions: but furthermore the sodium content was actually harmful. This is still a subject of debate today.

A note points out that tin may readily be recovered from tinplate clippings by electrolysis in a solution of caustic soda. Tinplate, says the note, carries from 2 to 3% of tin—which must evoke from the detinner of today a nostalgic sigh as he contemplates 0.5% electrolytic plate.

An article describes a new finish for copper ware: the copper is lead-plated (from a litharge-caustic potash bath) at a "current" of 2-3 volts. The ware is then heated to redness, and a beautiful red finish results.

A helpful note warns the plater not to hang his silver anodes in the cyanide bath by means of copper wires. In case you haven't guessed why, it is explained that the solution will attack the copper, resulting in contamination of the bath. Iron wire should be used.

A plater writes to inquire why he obtains a good deposit of nickel on one side of the work, a poor deposit or none at all on the other side. Logically enough, he is advised to employ two anodes with the work between them, instead of just one. There's one I could have answered myself.

Here's a fairly long article called "The Abuse of Electroplating," which, because it is a good example of an attitude which prevails up to the present among some of the more long-haired members of the profession, is worth paraphrasing at some length.

Electrometallurgy is in the hands of unscientific men. No attention is paid to the composition of a plating solution or the changes taking place during operation. When a solution didn't work the plater thought it needed a handful of this or a spoonful of that and threw it in, not knowing whether it was soluble or what change it produced. When that didn't work he added a handful of something else. When nothing worked he threw out the solution and made up a new one. But that was no better, because he made it up with a handful of this and a spoonful of that. The reason for all this?—the plater was not a scientist. His instruments were not scientific either. His voltmeter (please remember I'm just quoting the author of this article) was a rusty old file—if it sparked when placed across the terminals there were some volts in the vicinity.

* Names used in this paper are fictitious, but the items are either direct quotation or paraphrase of original articles in various journals.

The author, however, has a remedy for this deplorable condition. To quote further, he has for many years been endeavoring to bring this up to a scientific standard, and with many gratifying results. At the present time platers are giving more attention to the composition of their solutions. They weigh their materials, they use ammeters and voltmeters, and he is pleased to report that the results now obtained in plating of the various metals are far better in every way than formerly.

The unfortunate plater of this bygone day continues to be scolded. In the same issue of the same magazine we find an editorial: There are more than 1100 electroplating firms in the United States alone. This industry however, has developed as a separate industry touched but faintly by the development of other electrochemical processes and practically unaffected by the progress of science. Rule of thumb reigns supreme, although signs of an improvement are evident. But the improvement is due to the introduction of better apparatus rather than to a better understanding of principles on the part of platers. Future progress depends on the cooperation of the practical plater and the theoretical scientist.

Turning to more immediately practical matters, the plater is advised against using copper hooks for suspending nickel anodes: nickel wire and sheet is now available, although it must be imported from Germany. At the same time an editorial deplores the conditions in the nickel anode industry. It seems some makers of anodes, in order to cut prices, were adulterating their product with iron, some nickel anodes containing up to 15% of that element.

Item: An editorial on the discovery of radium. This marvel appears to disprove the law of conservation of energy. Radium is worth a million dollars a pound, and more can be told about it when it becomes more available and cheaper. It is reported, however, that in spite of its cost an Arctic explorer has taken some on his journey for the purpose of giving light—with good results.

A brand new application for electroplating is reported: a New York firm is said to have introduced to the trade the innovation of electroplating trinkets such as baby shoes.

The correspondence column of one of the magazines carries a request for a method of electrotinning and electrogalvanizing. In reply, it is noted that there is no good method of tin plating, although the tin chloride—sodium pyrophosphate bath is the best available. As for zinc, a strong solution of zinc sulfate is recommended, with the use of insoluble anodes of lead and a high current density: at least 30 amperes per square foot. (Which would indicate that some platers did know how to measure current density even if they had to use a rusty file to do it.)

We flip more pages and find a report of the supposed discovery of a new element, Amarillium, in copper ores. At about the same time the U. S. fleet was being entertained by the German emperor in Kiel. Both the German emperor and Amarillium have since disappeared from the world stage.

Here is another scolding for platers: in another journal they are taken to task on the score of instruments in the plating shop. It is surprising, says the writer (who probably wasn't really surprised at all) to find so many establishments without a voltmeter or ammeter—some do not even have a rheostat. Follows a rather elementary exposition of the subject of volts and amperes, what they are and their significance to the plater. The sooner rule of thumb is discarded and accurate methods substituted, pleads the author, the less will be the difficulties and the better the quality of the work.

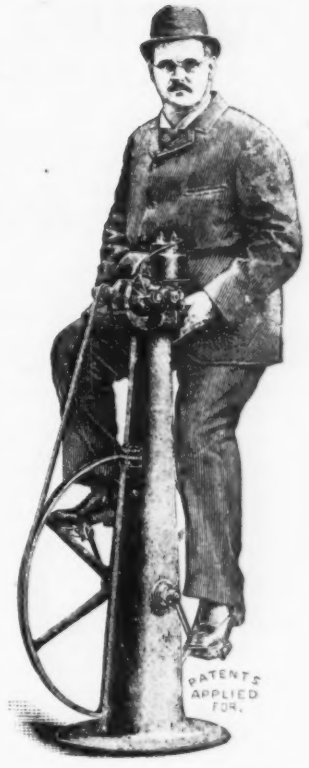
A new book appears of interest to platers, and it is reviewed by a not too friendly critic. The author purposely avoided theory but, according to the reviewer, he went too far in this respect. For example, says the critic, the author writes that "the construction of a dynamo for refining copper depends on the quality of the copper. A dynamo good enough for one variety would be unsuited for refining metal of higher resistance." Permitting the book to write its own unfavorable review, our critic quotes further: "These laboratory experiments cannot be relied upon, for the current was supplied by batteries whereas in practice dynamos are used." And: "It is easy to ascertain if the potash has lost its caustic property by dipping the tip of the finger in the solution and applying it to the tongue." (It might be objected that the author doesn't specify which finger—or do you use a different one each time?)

Two platers write in to a magazine to find out how to copper-plate aluminum and zinc, respectively. As to the first, the journal's anonymous expert is forced to pass: there is no really satisfactory method—an answer which might equally well have been given only a year or so ago. Not to give up without trying, though, he suggests trial of the cyanide bath and connecting the work to the cathode bar before immersion. Virtually the same prescription is given for plating on zinc.

Modern workers possibly do not realize that the heavy metal cyanides were not always articles of commerce; so a note telling how to make up a cyanide copper bath may be of interest. Half a pound of copper sulfate is dissolved in a quart of water; enough ammonia is added to dissolve the precipitate first formed and produce a clear blue solution. Then another quart of water is added and finally enough strong potassium cyanide solution to destroy the blue color and produce a yellowish-brown solution. The bath is worked at 120° F.

Discovery of yet another new element is announced: the year 1903 appears to have been propitious for filling in non-existent gaps in the Periodic Table. This one is called Selium and is reported by a Frenchman. It is lighter and stronger than aluminum, costs only 1/12 as much, and takes a polish like nickel. It sounds more like an aluminum alloy than a new element, says the editor.

One J. La Rix of Oregon has discovered still another new element, which he has named, with becoming modesty, Rixam. He also claims to have made silver out of gold—to quote him, "by reducing the number of ions in the gold atom I obtain silver." Mr. La Rix appears to have been a tsimehcla—that's alchemist spelled backwards. (Or perhaps he just missed discovery of the atomic bomb.)



Notice is taken of a new method of nickel plating invented by Thomas A. Edison. The process deals with plating on sheet steel: nickel is plated in the ordinary bath, the sheets are then heated in a reducing atmosphere to weld the nickel coatings to the steel backing. The tension in the nickel deposit is thus relieved and the sheets will stand forming and other operations.

Here's a feature article on organic matter in plating solutions. To show that writing in the technical press could have its lighter side, the author introduced his subject by saying "by organic matter is meant anything of animal or vegetable origin from a dead cat up to eau de cologne or a mince pie." It is the usual practice in well-run shops to avoid organic additions—at least of the types mentioned—but the author points out that some forms of organic material render possible some unique coatings, unobtainable in their absence. The varnishes leached from a wooden vat changed some deposits from brittle to tough. Benzoic acid in a copper sulfate bath produced a bright deposit. The use of gelatine in copper refining was well known.

Meanwhile, on the world stage, all eyes began to turn towards Russia, where abortive socialist revolutions were breaking out and where the rottenness of the Czarist regime would soon be proven as relations with Japan forewarned of impending war.

In their own field, the journals of the time had faithfully reported a year's progress in the art and science of electrodeposition. It must be restated that the foregoing survey does not do justice to those journals, for the reason that only items which seemed piquant, amusing, or notable in some respect have been selected. Naturally there were many eminently serious and unexceptional articles which lie outside the scope of this rather flippant review. See you in 1904.

PLATING AND POLISHING INDUSTRY

STRAIGHT-TIME AVERAGE HOURLY EARNINGS

A report on the straight-time average hourly earnings for selected occupations in the Plating and Polishing Industry in four midwestern states, January 1945. This report was prepared by *Everette B. Harris*, Regional Wage Analyst, and *John L. Dana* with the assistance of *Frances C. Bush* and issued August 1, 1945 thru the U. S. Department of Labor, Bureau of Labor Statistics, Wage Analysis Branch, Regional Office No. IX, Chicago 6, Ill.

Summary

WAGE earners in the electroplating, plating, and polishing industry received average hourly earnings ranging, for male workers, from 61 cents for watchmen to $1.68 for polishing and buffing-machine operators in January 1945. These data result from a Bureau of Labor Statistics study of the industry's wage structure, based on a representative sample consisting of 38 of the 84 plants located in Minnesota, Wisconsin, Illinois, and Indiana.

Scope and Method of Survey

This study of wages in the electroplating, plating and polishing industry covered 38 establishments employing a total of 1,747 wage earners. These establishments were representative of the 84 plants with 3,366 workers which make up the industry in Minnesota, Wisconsin, Illinois and Indiana. A representative sample of slightly less than twenty percent of the shops in Chicago were included, and all such establishments outside this city were covered. The plants included do electroplating, plating, and metal-polishing for the trade in peace-time. Before the war much of their product went to the automobile industry and to firms making electrical appliances, bicycles, and a wide variety of apparatuses and gadgets. At the time of the survey, they were subcontractors, engaged primarily in the plating and polishing of parts for airplanes, radios and radar equipment.

Trained field representatives visited employers to obtain the data collected during the survey directly from payroll sheets, time clock cards, and other plant records and by consultation with plant officials and employee representatives. Comparability of occupational data was assured by the use of uniform job descriptions in classifying workers in each plant. Ten key occupations, accounting for 48 percent of all workers employed in the plants covered, were selected for detailed study. Straight-time average hourly earnings were obtained for these key occupations, and in addition, over-all averages were determined for all plant employees combined, excluding technicians, supervisors, and supervisory foremen and other administrative personnel.

Industry Characteristics

Metalplating establishments are engaged in a highly specialized, technical operation. Their manufacturing activity consists of electrolytically covering metal objects with coatings of chromium, nickel, gold or other metals that can be buffed and polished to a brilliant finish. Such coatings are ordinarily rust-proof. The objects to be plated are first cleaned by immersing in a succession of cleansing baths. Parts not to be plated are then insulated, and the objects are immersed in a solution of metallic salts of plating metal and allowed to remain in this solution for the required period of time. The plater checks and maintains the solution at the prescribed strength and regulates controls necessary to maintain intensity of electricity flowing through the solution. After plating, the articles are removed and rinsed. The parts are then polished to a smooth surface and high luster by the use of rapidly rotating wheels and proper abrasives.

Establishments in this industry are typically small. Only one firm in the region employed more than 250 wage earners; twenty-seven of the thirty-eight plants studied had less than fifty employees each.

Table 1—Distribution of Plants and Workers, Electroplating, Plating, and Polishing Industry, Four Midwestern States,[1] by Wage Area and Unionization, January, 1945

Wage area	Total		Unionized		Nonunionized	
	Plants	Workers	Plants	Workers	Plants	Workers
Total	38	1,747	10	346	28	1,401
Chicago	13	1,023	0	0	13	1,023
Minneapolis	5	174	0	0	5	174
Milwaukee	3	112	2	102	1	10
South Bend	3	53	2	41	1	12
Rest of Region	14	385	6	203	8	182

[1] Plants were located in Minnesota, Wisconsin, Illinois and Indiana.

The Labor Force

A relatively small segment of the plating industry is organized at this time. Only one out of five workers was employed in union plants at the time of the survey (table 1). This factor varied by city, however, with none of the Chicago or Minneapolis shops unionized, as contrasted with two out of three shops in both Milwaukee and South Bend and six of the fourteen plants in the rest of the region operating under terms of collective bargaining agreements.

In January, 1945, women accounted for somewhat more than one-fifth (22.2 percent) of the total labor force in the plants studied. Most of the women for whom occupational earnings data were obtained were employed as platers' helpers. Fourteen of the 38 plants employed no women.

General Personnel Policy

Incentive methods of wage payments were rare in this industry; only four occupations were found in which this wage payment method was used. Even in these occupations, workers so compensated were not numerically important[1]. The vast majority of workers were paid hourly time rates.

Twenty-seven of the thirty-eight plants surveyed had formal rate structures. Of plants with such formal wage plans, twenty-two used a range of rates, as opposed to five with a policy of paying a single rate for each occupation.

Eighteen of the plants provided one week's vacation with pay, based usually upon the rate for forty hours, after one year or more of service with the firm. Only two of the firms made special provisions for sick leave.

Insurance plans covering life, health, or accidents were in effect in eleven of the establishments. In most of these plans, the employer contributed a percentage of the cost. A pension plan for workers was reported by one establishment.

Christmas bonuses were common in this industry. Twenty-one plants regularly gave such bonuses ranging from the proverbial turkey to $100.00 in cash. Several gave war bonds varying in amount up to $100.00. The usual bonus, however, was a cash gift of from $10.00 to $25.00 to all employees. Only one firm provided for an annual bonus based upon a percentage of earnings during the previous year.

Seventeen of the plants worked two shifts a day and two plants were on a three-shift basis. Fifteen plants working more than one shift paid a differential for late-shift work. In seven of the firms the amount was a definite cents-an-hour premium, usually five cents, over the regular day rate. Others allowed a small percentage differential or paid for a short lunch period.

The normal workweek for both men and women ranged from 45 to 60 hours per week. In the majority of plants, however, the length

[1] Less than five percent of the workers were compensated under incentive methods of wage payment (a total of 122, 109 of whom were employed in Chicago).

Table 2—**Straight-Time Average Hourly Earnings,[1] Selected Occupations, Electroplating, Plating and Polishing Industry, Four Midwestern States[2], by Wage Area, January, 1945**

Occupation and sex	All establishments: Number of establishments	Number of workers	General average	Lowest establishment average	Highest establishment average	Average hourly earnings by wage area: Chicago	Minneapolis	Milwaukee	South Bend	Rest of Region
Industry averages (plant workers only—office excluded)	38	1,747	$0.91	XX	XX	$0.94	$0.92	$0.78	$0.87	$0.76
MALE										
Maintenance men, general utility	20	26	.99	$0.55	$1.20	1.01	1.00	.80	1.00	.82
Working foremen, processing department	24	50	1.05	.60	1.50	1.05	1.27	1.00	.90	.95
Platers	35	210	.97	.65	1.15	.99	1.03	.80	.83	.86
Platers' helpers	33	237	.80	.58	.92	.82	.74	.92	.68	.68
Polishers and buffers, metal	18	66	1.28	.71	1.53	1.34	1.05	1.10	1.10	1.02
Polishing and buffing-machine operators	10	39	1.68	.73	2.30	1.78	.95	1.11		.73
Loaders and unloaders (shipping and receiving)	11	14	.85	.60	1.00	.89	.73	.88		.69
Truck drivers	7	7	.98	.68	1.20	.99			1.00	.68
Janitors	9	10	.71	.60	.90	.71	.80	.70		.66
Watchmen	11	18	.61	.47	.88	.60				.63
FEMALE										
Working forewomen, processing department	3	3	.82	[2]	[2]	.81	—	—		.91
Platers	4	11	.73	.68	.80	—	—	.70		.76
Platers' helpers	17	146	.67	.51	.79	.68	.68	.58		.62

[1] Exclusive of premium payments for late-shift and overtime work.
[2] Average not shown to avoid disclosure of identity of individual establishments.

of the workweek for women was shorter than that for men.

All of the plants paid time and one-half after 40 hours per week in conformity with the Fair Labor Standards Act of 1938. Approximately half of the firms paid time and one-half after eight hours in one day.

Average Hourly Earnings

Straight-time average hourly earnings, excluding premium payments for overtime and night-shift work, are shown in table 2 for selected occupations and for all wage earners in the plants studied. In addition to the general average and extreme plant averages for selected occupations by sex, the occupational averages for the four principal cities and the rest of the region are also shown.

Industry averages, based upon the rates of pay for all wage earners in the plants studied in Chicago and Minneapolis, amounted to 94 and 92 cents an hour respectively. South Bend, Milwaukee and the rest of the region combined followed in the order named with hourly averages of 87, 78 and 76 cents.

Occupational earnings of male workers varied from 61 cents an hour paid to watchmen to $1.68 for polishing and buffing-machine operators. For women, whose earnings were somewhat lower than those of men in the same jobs, the range was from 67 cents an hour for platers' helpers to 82 cents an hour for working forewomen in the processing departments. While there is no uniform pattern of rates from city to city, it will be noted that Chicago was highest for a number of occupations, Minneapolis was highest for a few, and the "rest of region" was lowest in most of the job averages. The average hourly earnings of platers was lower than that of platers' helpers in Milwaukee. In some small establishments the owner, manager, or foreman may do the plating, hiring only platers' helpers. Rates for helpers in these plants may be higher than platers' rates in other establishments, and this may account for the apparent discrepancy in rate relationships.

Unionization was not extensive in this highly specialized industry. An analysis revealed no direct relationship between the level of wage rates and size of establishment. Only a negligible number of workers were compensated by incentive methods of wage payment.

Distributions of Earnings of Individual Workers

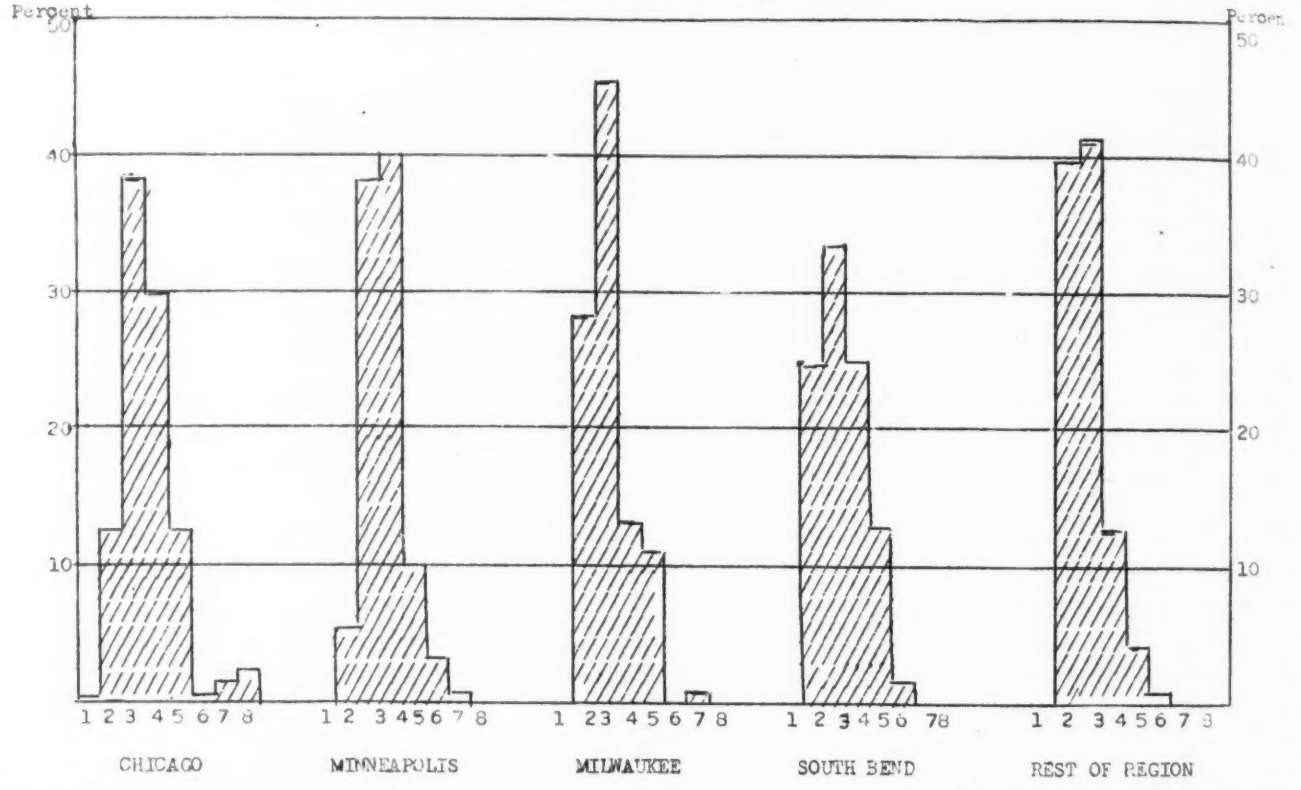
Distributions of the earnings of all individual plant employees are shown separately for Chicago, Minneapolis, Milwaukee, South Bend, and the Rest of Region in table 3 and on the accompanying graph (chart 1). Large cities have more employees in the higher wage brackets than do the small towns. For example, only 52 percent of the workers in Chicago received less than 90 cents an hour, in contrast to 80 percent earning less than this amount in the "rest of region" area. In Chicago, three percent of the workers earned more than $1.70 an hour, whereas none of the workers in the "rest of region" area earned more than this amount and only one percent earned more than $1.30 an hour.

Table 3—**Percentage Distribution by Average Hourly Earnings[1] of Workers in the Electroplating, Plating and Polishing Industry, by City in Four Midwestern States,[2] January, 1945**

Average hourly earnings	Chicago: Number of workers	Chicago: Per cent	Milwaukee: Number of workers	Milwaukee: Per cent	Minneapolis: Number of workers	Minneapolis: Per cent	South Bend: Number of workers	South Bend: Per cent	Rest of Region: Number of workers	Rest of Region: Per cent
All workers	121	100.0	105	100.0	169	100.0	51	100.0	351	100.0
Under 50 cents	2	0.5	—	—	—	—	—	—	—	—
50 and under 70 cents	55	13.1	30	28.6	12	7.1	13	25.5	141	40.2
70 and under 90 cents	162	38.5	48	45.7	65	38.5	17	33.3	145	41.3
90 and under 110 cents	127	30.2	14	13.3	67	39.6	13	25.5	45	12.8
110 cents and under 130 cents	54	12.8	12	11.4	18	10.7	7	13.7	16	4.6
130 cents and under 150 cents	1	.2	—	—	6	3.6	1	2.0	4	1.1
150 cents and under 170 cents	6	1.4	1	1.0	1	.6	—	—	—	—
170 cents and over	14	3.3	—	—	—	—	—	—	—	—

[1] Exclusive of premium payments for overtime and late-shift work.
[2] Illinois, Indiana, Minnesota, Wisconsin.

CHART 1.—Percentage Distribution by Average Hourly Earnings of Workers in the Electroplating, Plating and Polishing Industry, by City in Four Midwestern States, January, 1945.



KEY. 1—Under 50 cents; 2—50 and under 70 cents; 3—70 and under 90 cents; 4—90 and under 110 cents; 5—110 and under 130 cents; 6—130 and under 150 cents; 7—150 and under 170 cents; 8—170 cents and over.

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TAKING IT OFF?

A Presentation of Current Methods of Stripping Metallic Coatings

By GEORGE BLACK

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THE realization that taking it off can be just as important as putting it on is of very recent date. Not that the information wasn't available before, but the emphasis has been directed elsewhere and the plater has had to rely on a lot of experimentation coupled with his own set of hand-me-down rules. Today, however, there is a marked tendency not only to standardize stripping methods and procedures, but to pass the information along in simplified form so that it gets down to the workman's level where it belongs.

Practically all plated coatings can be removed either by simple immersion or anodic stripping. The choice of the method is usually dependent upon the time allowable and the equipment available. The composition of the stripping bath is also dependent upon the time and equipment factors, but in addition, both the metal to be stripped and the basis metal come in for consideration. Whenever possible it is advantageous to choose a stripping medium which will not attack the underlying metal, or one which will react with it so slowly that the attack under normal conditions will be negligible.

One of the most general statements that can be made concerning the stripping of metallic coatings, is that the majority of plated deposits are soluble in cyanide. Brass, bronze, cadmium, copper, zinc, gold and silver coatings can all be stripped from steel surfaces in a room temperature solution of sodium cyanide, sodium hydroxide and water if the parts are made the anode at approximately six volts. The following solution is recommended:*

Sodium cyanide	12 oz.
Sodium hydroxide	2 "
Water to make	1 gal.

There are, however, faster and more efficient methods for the removal of these deposits.

Cadmium coatings may be quickly and cleanly stripped by simple immersion in a room temperature solution of ammonium nitrate and water. One pound of ammonium nitrate to the gallon is the most desirable solution. If additional speed is desired, and a smut-free surface is not required, a room temperature solution of antimony oxide, hydrochloric acid and water in the following proportions is suggested:

Hydrochloric acid	1 gal.
Antimony trioxide	2 oz.
Water	½ pt.

The Canning Practical Handbook advises that cadmium coatings may be stripped rapidly in a solution of ammonium persulfate and ammonia. The solution is made by dissolving eight ounces of ammonium persulfate in a gallon of cold water, and adding slowly four fluid ounces of liquid ammonia.

The fastest method for the removal of zinc deposits is simple immersion in concentrated hydrochloric acid at room temperature. In order to protect the steel base it is recommended that antimony oxide be added in the ratio of three ounces to the gallon. When the basis metal is brass the hydrochloric acid should be diluted so that the resultant stripping solution contains no more than fifteen ounces per gallon.

The removal of copper coatings from non-ferrous metals is usually accomplished by alternate immersion and brushing in a room temperature solution of sodium sulfide, sulfur and water, in the following proportions:

Sodium sulfide	28 oz.
Sulfur	2 "
Water to make	1 gal.

This formula has been suggested by the Bell Telephone Laboratories. Although the solution is used at room temperature, it is necessary to boil it during preparation in order to dissolve the sulfur. Brushing is required after each five minutes of immersion in order to remove the loose sulfide. After several immersions it is recommended that the work be dipped in a 10% sodium cyanide solution. If any deposit remains the whole procedure must be repeated.

Copper deposits can be stripped from zinc by making the work the anode at two volts in a solution of sodium sulfide and water in the ratio of one pound of sodium sulfide to a gallon of solution. Any sulfide such as a polysulfide, oxidizing liquid, liquid sulfur, etc., may be used for the removal of copper through the formation of copper sulfide. The stripping of copper deposits from a steel surface can be done electrolytically by making the work the anode at six volts in a room temperature sodium cyanide solution. The Canning Handbook recommends the following:

Sodium cyanide	1 lb.
Water	1 gal.

The removal of chromium deposits from steel or nickel may be accomplished electrolytically by treating as anode in a room temperature solution of sodium hydroxide and water. Six ounces of sodium hydroxide per gallon of solution is recommended. The use of hydrochloric strips when removing chromium from brass, copper or nickel, is widespread, but the Canning Handbook points out that extreme precautions with regard to rinsing must be taken if the parts are to be replated. The slightest trace of hydrochloric acid in the plating bath renders it unfit for use. Another point worth considering is that the hydrochloric acid strip causes nickel surfaces to become passive, and unless these surfaces are reactivated they cannot be rechromed. Chromium deposits over nickel undercoats can be removed in a sulfuric acid stripping bath, but the nickel will be removed along with the chromium. The hydrochloric acid baths may be concentrated and used at room temperature, or a water solution in the ratio of one pint of acid to a gallon of solution used at a temperature of 125° F. The sulfuric strip is identical with that described below as suitable for removing nickel deposits from steel.

Water solutions of sulfuric acid are used universally for the stripping of nickel deposits. Additions of glycerine or copper sulfate crystals are recommended in order to lessen the attack on the basis metal. The parts to be stripped are made the anode at six volts in the following solution:

Sulfuric acid	1 gal.
Glycerine	1 oz.
Water	1 pt.

If copper sulfate crystals are added instead of the glycerine, additions should be made in the ratio of four ounces per gallon. Fuming nitric acid forms an excellent nickel strip, but a great deal of care is required to prevent dilution of the nitric acid with subsequent rapid attack on the underlying metal. The work must be put in dry and

*Note: Unless otherwise stated, all formulas are taken from the 1944 Plating and Finishing Guidebook, published by Metal Industry Publishing Company.

extreme precautions must be taken to keep out moisture. In the stripping of nickel from brass or copper, hydrochloric acid solutions containing two ounces of HCl per gallon of water, may be used instead of the standard sulfuric strip. Gas carbon cathodes should be used, and the electrolyte is utilized at room temperature.

As previously stated, the noble metals gold and silver, can both be stripped from steel surfaces in a water solution of sodium cyanide. The removal of gold deposits from copper and its alloys, high nickel alloys, and ferrous metals is accomplished in the following bath:

Sodium cyanide	2 oz.
Water	1 pt.
Hydrogen peroxide	½ fl. oz.

It is recommended that the solution be used by the pint, and that only a few pieces at a time be stripped; otherwise the violent gassing will cause the solution to boil over. After the gassing ceases, more peroxide is to be added. If the solution turns blue or is not clear, more cyanide is needed.

The following formula is recommended for the stripping of silver deposits from brass or nickel silver:

Sulfuric acid	19 parts by vol.
Nitric acid	1 " " "

Simple immersion in this water-free solution at 180° F. will give the best results. Silver may also be removed from white metal electrolytically, by making the work the anode at four volts in a sodium cyanide solution, using four ounces of sodium cyanide to make a one gallon water solution.

The stripping of tin deposits from steel, copper or brass can be accomplished by using the hydrochloric acid, antimony trioxide strip recommended for the removal of cadmium plating. Tin coatings may also be stripped from the cuprous alloys using the following formula:

Ferric chloride	10-14 oz. ga
Copper sulfate	18-21 "
56% acetic acid	40-60 fl. "

It is worth noting, however, that the Navy Aeronautical Specification for Tin Plating, PC-12, recommends that tin coatings be removed in an alkaline electrolytic cleaner rather than in an acid bath.

The foregoing does not cover all the stripping methods now in use, nor did it intend to. The purpose of this paper was to bring to the plater's attention the most popular methods now in use, and to remind him that whether he is stripping coatings to correct improperly applied work, or for the purposes of quantitative determination of weight and thickness, it is imperative that the same care exercised in application be exercised in the removal.

Electrolytic Determination of Copper and Zinc In Brass Plating Baths and in Brass Electrodeposits

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IN A PRIOR paper (*1*) reference was made to the present electrolytic method for zinc and copper, in which the copper and zinc are codeposited from a cyanide solution containing ammonium sulfate and ethanolamine, the deposit is dissolved in sulfuric and nitric acids, and the copper is deposited. During the intervening months the procedure has proved more convenient and rapid than was reported, without sacrificing precision and accuracy. It has been successfully used for the determination of copper and zinc in brass plating baths and in electrodeposited brass and has also been adapted to the determination of cadmium, zinc, or copper in plating baths.

Recently, a procedure similar to the present one has been reported by Verdin (*2*). However, his method requires 3 hours for the determination of copper and zinc while the present method requires from 45 to 50 minutes.

Apparatus

The electrolytic apparatus used consists of one stationary platinum gauze electrode (3.5 cm. in diameter and 4 cm. high) and one central revolving platinum gauze electrode (2 cm. in diameter and 4 cm. high) with a 6-volt rectifier operating from a 110-volt alternating current line. The machine is equipped with an electric hot plate for heating the sample and a reversing switch for changing the polarity of the electrodes. The only other pieces of apparatus required are an ordinary analytical balance and a drying oven.

Table I. Accuracy of Method

Substance (Plus Blank)	Electrodeposit *Gram*	Error *Gram*
Stock brass-plating solution (blank)	0.2590	
Ferrocyanide	0.2594	+0.0004
Silicon (added as silicate)	0.2587	−0.0003
Arsenic (added as arsenite)	0.2665	+0.0075
Lead (added as plumbite)	0.2664	+0.0074
Nickel (added as cyanide complex)	0.2692	+0.0102
Antimony (added as antimonite)	0.2615	+0.0025
Tin (added as stannite)	0.2648	+0.0058

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Solutions

Supporting electrolyte, 200 grams of ammonium sulfate and 40 ml. of Eastman Kodak ethanolamine (practical) per liter. This solution should be filtered before it is used.

Acid mixture, 2 parts of 18 *N* sulfuric acid to 1 part of 6 *N* nitric acid.

Sodium sulfide, 25 grams of sodium sulfide nonahydrate per 3[illegible] ml. of solution.

Sodium cyanide, 5% solution.

Brass electrodeposit stripping solution. A solution 8 *N* in ammonium hydroxide and containing 25 grams of ammonium persulfate per liter; 5 drops of 30% hydrogen peroxide are added to each 25 ml. portion of this solution before it is used.

Procedure for Analysis of Brass-Plating Solution

Centrifuge a portion of the cyanide brass-plating solution to be analyzed. Pipet 10 ml. of the clear solution into a 180-ml. electrolytic beaker and add 50 ml. of the supporting electrolyte. Heat just to boiling and using a weighed platinum electrode, electrolyze in a covered beaker at 2.5 to 3.0 amperes, maintaining a temperature of 80° C. Wash down the sides of the beaker several times during the process of electrolysis. After the sample has run for 15 minutes, test for completeness of copper removal by mixing on a spot plate 1 drop of the solution and 1 drop of concentrated hydrochloric acid, then adding 1 drop of the sodium sulfide test solution. A brown color indicates that the copper has not been completely removed.

When the electrodeposition is complete, wash the electrode with distilled water, dip it in dry acetone, and heat in the oven at 110° C. for 5 minutes. Cool and weigh.

Place the weighed electrode in a 180-ml. electrolytic beaker and add 3 ml. of the prepared acid mixture. Allow a portion of the brass to dissolve in the acid. Without removing the electrode from the beaker, connect the electrode and after adding enough water to cover the brass deposit, strip the brass electrolytically by reversing the original polarity and electrolyzing at 0.5 to 1 ampere till the platinum is bare (about 5 minutes). The polarity is now returned to normal and the copper deposition is begun, first at 0.5 ampere until the electrode is covered (about 1 minute) and then at 1.5 amperes until deposition is complete (about 10 minutes). Wash, dry, cool, and

(Concluded on page 462)

THIS IS WASHINGTON—

By George W. Grupp
METAL FINISHING's Washington Correspondent

Handley and Grupp Address Baltimore-Washington Branch The first meeting for the 1945-1946 season of the Baltimore-Washington Branch of the American Electroplaters' Society, which was held at the Engineers' Club of Baltimore, was addressed by George W. Grupp, the Washington Correspondent of *Metal Finishing*, on the subject of "The Pacific Corrosion Problem and the Need for Research," and by Robert F. Handley, Local Supervisor of the War Manpower Commission's Apprentice Training Service, on the subject of "The Value and Importance of Apprenticeship Training to the Electroplating Industry."

Electroplating Apprenticeship Discussed By Handley In his talk Mr. Handley emphasized the importance of definite standards which should be attained in an electroplating apprenticeship course. He is of the opinion that the course should serve a specific purpose. Certain requirements should be set up which will eliminate misfits before they start training. And to weed out those misfits who may get by in the first test, there should be a probationary training period at the outset of the course. He pointed out that the course should be of a character which will enable trainees to solve the electroplating problems which they will have to face in the industry. And to keep the course at a high level he suggested that a study should be made of electroplating shop supervision to ferret out faulty methods. The pay of trainees he said, should be increased as they progress in their course of training. And to prevent a surplus of electroplaters he warned against training more young men than the industry is able to absorb. To prevent friction and misunderstanding, Mr. Handley remarked, a written agreement should be entered into between the trainer, or master craftsman, and the apprentice which clearly outlines the course of training the apprentice is to receive, the amount of compensation he is to receive as he progresses in the course, and the kind of certificate he will be given upon completion of the course to attest that he is a fully trained craftsman in electroplating. Before concluding his talk Mr. Handley suggested that the Branch appoint a committee which will outline a course of training which will be most beneficial to the electroplating industry and to the apprentice.

A. K. Graham to Address Baltimore-Washington Branch A. Kenneth Graham, secretary of the American Electroplaters' Society, will be the speaker at the November 6th meeting of the Baltimore-Washington Branch which will be held at the Kenesaw Apartments Dining Room, Washington, D. C.

Baltimore-Washington Branch Schedule of Meetings in 1945-1946 Throughout the 1945-1946 season the Baltimore-Washington Branch's meetings in Baltimore will be held at the Engineers' Club, and the Washington meetings will be held at the Kenesaw Apartments Dining Room. Any platers, or other interested persons, are welcome to these meetings which are scheduled as follows: Washington: November 6, 1945, January 8, 1946, March 5, 1946, and May, 1946. Those held in Baltimore will be held on December 4, 1945, February, 1946, and April 2, 1946. The attendance chairman for October was Maurice Caplan. Fred F. Pierdon is the November chairman; Robert Guerke is the December chairman; George M. Keller is the January chairman; Wendell Barrows is the March chairman; Bradford Clark is the April chairman, and Grace Riddell is the May chairman. The chairman for the annual dinner and dance to be held in Baltimore will be announced later.

Membership Campaign Being Conducted Under Leadership of Brenner The Baltimore-Washington Branch aims to increase its membership by 30 this year. Abner Brenner is planning to call on each member of the Branch to secure his cooperation to make possible this goal. Efforts will be made to have suspended members reinstated.

Intense Research Fund Campaign in Progress Under the leadership of Abner Brenner of the National Bureau of Standards, and L. G. Tubbs of the Mutual Chemical Company of America with Maurice Caplan of Oscar Caplan Manufacturing Company, as chairman, the Baltimore-Washington Branch has started an intensive campaign of soliciting over 170 different firms in Baltimore and Washington to contribute funds to the American Electroplaters' Society research fund. In addition, individual members of the Branch will be asked to make contributions in spite of the fact that the Branch's treasury has already given $100 toward the fund.

Ermlich Now Heads Platers' Surplus Section of RFC Wilbert S. Ermlich, Jr., a charter member, and twice president of the Baltimore-Washington Branch of the American Electroplaters' Society, formerly superintendent of finishing operations of the Baltimore plant of the Revere Copper & Brass Company, has been appointed Chief, Materials Handling Equipment Section, Office of Surplus Property, Reconstruction Finance Corporation. His section is in charge of the disposition of all surplus electroplating, degreasing, pickling, washing and drying equipment, metal spraying equipment, cranes and hoists of all kinds, conveying systems of all types, scales and balances and all sorts of other material handling and electroplating and anodizing equipment. During the war, he developed a secret process for the War Department, and placed it in operation in a number of plants, for the manufacture of precision electroformed searchlight reflectors. And as Field Director for John M. Thorne, Inc., industrial, engineers of Chicago, Ill., he called on all of the major electronic plants in the promotion of radar and radio engineering. Mr. Ermlich, whose office is in Washington, said he would be glad to assist all members of the A. E. S. and others in securing any Government surplus equipment they may desire for reconversion and replacement purposes in their metal finishing establishments.

Rice Now in Machine Tool Section of RFC Charles A. Rice has been transferred from the disposition of surplus electroplating equipment to that of an industrial specialist, in the Machine Tool Section, Industrial Equipment Subdivision, Disposal Division, Reconstruction Finance Corporation. His new position will require his calling on regional offices, advising on disposal, and inspecting machine tool equipment throughout the United States.

Electroplating Equipment Wanted At the Department of Commerce it was learned that Eric Wyborn Stokes, representing Stokes & Sons, Pty., Ltd., Albert Street, Brunswick, Melbourne, Victoria, Australia, wishes to contact manufacturers of silverware and electroplating plant equipment. He may be reached up until December 31, 1945, by addressing him, c/o Australian Legation, 3117 Woodland Drive, Washington, D. C.

Platers Are Building Up Stockpiles of Nickel Salts According to current reports, the demand for nickel salts far exceed the supply. In some instances, it is reported, that producers are unwilling to accept additional orders until after the first of the year. This increased demand is said to be due to the anxiousness of electroplaters to pile up sufficient stock for future civilian demands for plated ware.

Civilian Production Administration Takes Over WPB Duties On November 3, 1945, the War Production Board passed into history; and what was left of it was transferred to the Civilian Production Administration which was created by Executive Order by President Truman. J. A. Krug having resigned, the Administrator of the CPA will be J. D. Small. The new organization will consist of five bureaus whose functions will be as follows: (1) The Industrial Reconversion Operations Bureau will deal with problems "affecting particular industries which produce or consume scarce raw materials and products such as rubber, forest products, tin, lead and some minerals, some construction materials, a few textiles and chemicals, and various hard goods and equipment items." (2) The Reconversion Priorities Bureau "will be responsible for the modification of general priorities and allocation controls (as distinct from the problems of particular industries), the internal clearance of agency actions, appeals, inventory problems, compliance, and relationships with other government agencies." (3) The Field Operations Bureau attends to operations in the field including compliance. (4) The International Supply Bureau is in charge of imports, exports and international allocations. And (5) the Demobilization Bureau is charged with the task of functional demobilization and transfers, budgets, personnel, administrative services, and records.

Plant Deductions May Be Written Off More Rapidly for Tax Purposes The War Production Board revealed on September 29, 1945, that war contractors who used their own funds to finance plants needed in the military program may write off the cost for tax purposes in less than five years without having to file individual applications with the WPB. The proclamation signed by President Truman ended the emergency period under Section 124 (e) (2) of the Internal Revenue Code. This proclamation allows all holders of Necessity Certificates to deduct that portion of the cost of their facilities certified against their wartime income without requiring them to apply individually for Non-necessity Certificates. Anyone who elects to take the increased amount of deductions thus allowed is required to spread them evenly over the shorter period of time. He must file with the Commissioner of Internal Revenue, Washington, D. C., a statement of election containing a description clearly identifying the facilities. This statement must be filed before the end of 1945.

1939 Compared With 1944 The production of acetates including butyl, ethyl, lead, sodium, etc., increased from $22,900,000 in 1939 to $56,100,000 in 1944. The production of acids, including acetic, boric, hydrochloric, hydrofluoric nitric, sulfuric, etc., increased from $82,300,000 in 1939 to $149,300,000 in 1944. The production of oxides, including antimony, magnesium, chromium, mercury, tin, etc., increased from $10,100,000 in 1939 to $17,000,000 in 1944. The production of stearates, including aluminum, zinc, etc., increased from $1,400,000 in 1939 to $3,700,000 in 1944. The production of sulfates, including aluminum, copper, magnesium, sodium, etc., increased from $22,900,000 in 1939 to $41,000,000 in 1944. The production of sulfites, including sodium hydro, zinc hydro, etc., increased from $5,200,000 in 1939 to $16,800,000 in 1944. The production of cleaning and polishing preparations increased from $76,800,000 in 1939 to $84,000,000 in 1944. The production of wood naval stores increased from $13,400,000 in 1939 to $33,000,000 in 1944. The production of paints, varnishes, lacquers, enamels, drying oils, fillers, putty, and shellac increased from $418,400,000 in 1939 to $700,000,000 in 1944. The production of lead oxides, lithopone, zinc and titanium pigments increased from $113,100,000 in 1939 to $155,000,000 in 1944.

Technical Advisory Service of SWPC Free to Industry Members of the metal finishing industries should be interested to know that the Technical Advisory Service of the Smaller War Plants Corporation is prepared to aid metal and organic finishers in solving any of their problems even though the war is over. It aims to solve specific problems. For example, one firm writes "We do a lot of retinning on several kinds of metal and have very good results, but have always had trouble with cast iron. We sometimes get cast iron that has been galvanized, to be retinned. We pickle this cast iron in muriatic acid to properly clean same but it will not take the tin properly. What is the trouble? Also when we retin cast iron that has been once galvanized there is a heavy scum that floats on the top of the tin kettle which we must remove and is a waste as it will not mix with the other tin in the kettle. Will this injure or break down the balance of tin in the kettle?" In reply to these two questions the writer received a specific reply which carefully analyzed his problem by six nationally known experts. And in addition to that he was supplied with complete instructions on the whole process of retinning. This service is set up to especially help small businessmen. Platers should present their problems to the nearest regional office for forwarding to Washington.

Most Business Men Want OPA Control Continued According to a survey made by Price Administrator Chester Bowles, only 6 per cent of the replies received favor the immediate ending of OPA controls. Thirty-nine per cent were of the opinion that price controls should end at some indefinite date after the first of the year. These percentages are based on 1486 replies received in response to an inquiry letter sent to 7,300 members of OPA advisory committee members.

Function of Federal Research Agency In his recent report to the President and to the Congress Director John W. Synder of the Office of War Mobilization and Reconversion, stated that the functions of the proposed central Federal research agency should be "1. To promote and support fundamental research and development projects in all matters pertaining to the defense and security of the Nation. 2. To promote and support research in the basic sciences and in the social sciences. 3. To promote and support research in medicine, public health, and allied fields. 4. To provide financial assistance in the forms of scholarships and grants for young men and women of proved scientific ability. 5. To coordinate and control diverse scientific activities now conducted by the several departments and agencies of the Federal Government. 6. To make fully, freely, and publicly available to commerce, industry, agriculture, and academic institutions the fruits of research financed by Federal funds."

Tax Refund Ruling Expected It is reported that the Securities and Exchange Commission may issue before the end of this year a ruling on tax refunds which corporations may receive in connection with unamortized balances on the cost of new facilities built for the war effort under certificates of necessity.

Technological Aids To Be Offered By Commerce Department To Business In Secretary of Commerce Henry A. Wallace's recently announced operating and organizational program for the Department of Commerce it is interesting to observe that it aims (1) to offer technical advisory service; (2) to undertake on a

cost basis, technical research work on specific problems for individual enterprises, where commercial facilities are not readily available; (3) to promote the existing commercial standardization work of the Bureau of Standards; (4) to continue the activities of the National Inventors Council, and (5) to modernize Patent Office procedures and practices.

Method A to Figure Price Increases Revoked Increased price figuring Method A of Supplementary Order 119 was revoked by OPA on October 12, 1945, because it resulted in serious distortions in fixing some price ceilings. From now on all manufacturers eligible for individual price increases on reconversion goods must use Method B under which ceiling prices are figured from cost data in the profit and loss statement for the smallest segment of the business in which the reconversion product is made and for which separate accounts are available.

WLB Bars Wage Cuts In Reconversion The War Labor Board on October 9, 1945, denied a request of the American Car & Foundry Company of Wilmington to lower wages for mechanics. This decision aims to establish the principle that management must pay the wartime rate of wages where job classifications have not been changed by reconversion.

Why Some Controls Are Continued In his final report Chairman Krug of the War Production Board states that the few remaining controls will be continued by the newly created Civilian Production Administration (1) to prevent speculative buying and hoarding of materials and products; (2) to restrict consumption of items which are tight in supply such as tin and lead; (3) to assure the meeting of remaining military requirements, and (4) to insure equitable treatment of small business, of veterans, and of export commitments.

Commerce Expert Warns Against Post-War Expansion Charles H. Sevin of the Distribution Cost Unit of the Department of Commerce in the October number of *Domestic Commerce* sounded the warning that persons would be ill-advised to expand into new markets merely because sales prospects appear promising. It is his opinion that "the profitability of orders obtained under temporarily favorable circumstances in territories in which a firm did not previously sell may be very deceptive. It is the cost and profit opportunities in the longer run, and under more normal conditions, that should be evaluated."

Compulsory Patent Licensing Opposed The National Association of Manufacturers has taken a definite stand against the several bills before Congress which provide for compulsory licensing of all patents. Holders of patents, under these measures if passed, will no longer have the exclusive right to produce their inventions. Competitors will be privileged to make them under license.

Unemployment Increasing The Bureau of Census reveals that unemployment doubled during the first three weeks following V-J Day. It reports that 1,650,000 were unemployed during the first week of September.

Order Taking Days Are Over Under Secretary of Commerce Alfred Schindler in an address on "Post-war Planning" delivered before the Washington Board of Trade on October 11, 1945, among other things said: "You have heard a good deal about 60 million jobs. I like to feel that 60 million jobs mean 60 million customers. I don't think we have put nearly enough emphasis on the marketing end of our problem. The war is over. We've had a few hectic years in which all a salesman needed was an order book and lead pencil, but those days are gone, or soon will be. We're back now to the old, old problem of distribution and selling."

George W. Taylor Resigns from National War Labor Board George W. Taylor resigned as chairman and as a member of the National War Labor Board on October 13, 1945. Immediately after sending his resignation to the President the Board paid him a tribute by saying that "In a position of unprecedented power in the field of labor relations you sought always to avoid the use of that power."

OWMR Economists Envision Deflation In 1946 The Office of Mobilization and Reconversion economists recently recommended that the majority of the controls of industry should be dropped in November. They believe 1946 will usher in a deflationary period with labor earnings on the decline.

OPA Wants Cost Information to Fix Post-War Prices Chester Bowles, Administrator of the OPA is urging industry to submit cost information at the earliest possible moment so that price ceilings can be placed on peacetime goods and services. To get this information the OPA is sending out questionnaires.

RFC Wants to Sell War Production Plants During the past month the Reconstruction Finance Corporation has been offering all sorts of plants for sale. Those who are interested in buying new or additional facilities should get in touch with the nearest RFC regional to get a copy of the published list of available plants.

Preference Ratings Required Under PR-13 Declining Since civilian buying is now generally unrated, no preference ratings are required under Priorities Regulation No. 13, the WPB announced on October 1, 1945. This action was taken to facilitate the movement of idle, excessive and surplus materials. However restrictions still continue on antimony, pig tin, babbitt, tin, and a few other raw materials.

Inventory Regulation Amended Because of the revocation of the Controlled Materials Plan on September 30, 1945, Priorities Regulation No. 32 was amended so that paragraph (d) (3) now reads: "If the inventory limits applying to any material are made more restrictive, whether by a change in Table I or otherwise, any person affected must immediately cancel, reduce or defer any order for the material to the extent that the scheduled delivery would result in an inventory greater than permitted by the new restriction and other applicable provisions of the regulation." Enumerated in Table I, just referred to in the amended text, are such items as fractional horsepower motors, pig lead, rosin, tin, and white lead. This inventory regulation is expected to be amended still further in the near future.

PR-1 Amended to Conform to New System of Ratings Priorities Regulation No. 1 was amended on October 1, 1945, because of the wholesale revocation of controls and the expiration of the Controlled Materials Plan. The amended regulation indicates that preference ratings in order of precedence are AAA, MM, and CC. This makes this regulation uniform with PR-29. The AAA rating is for emergencies; the MM is for military needs, and the CC is for needs of civilian industry in special cases. Interpretation 3 to PR-1 was amended to substitute the MM rating for AA-4 and the CC rating for AA-5.

All Silver Prices Now Uniform Amendment No. 1 to Revised Maximum Price Regulation No. 198, issued on September 21, 1945, the ceiling price of foreign silver was increased from 45 cents to 71.111 cents per fine ounce. . . . the present price for domestic silver.

Bank of Mexico Controls Silver Distribution of Mexico The monopoly right to buy and sell all but industrially worked silver in Mexico was granted to the Bank of Mexico by official decree on September 25, 1945. Silver producers must sell their silver to the bank, which in turn will sell the silver to industry.

567,024 Tons of Tin Cans Salvaged During War The War Production Board's tin can salvage program resulted in the delivery of 567,024 gross tons of used tin cans to detinning plants between September, 1942 and June, 1945.

AA Ratings Voided All orders rated AA which were originally accepted and scheduled for delivery by September 30, 1945, but through circumstances beyond the supplier's control were not delivered were declared void by the War Production Board and treated as unrated orders. This was accomplished by issuing, on September 24, 1945, Interpretation 1 to Priorities Regulation 29 which states that AA ratings remain effective only to deliveries made up to September 30, 1945, and that thereafter AA ratings must be disregarded by suppliers.

Labor Legislation Pending in Congress The chief bills before Congress which concern themselves with labor are Senate 1274 and House 3891 which provide up to $25 a week for 26 weeks for unemployed; Senate 380 makes the United States Government responsible for seeing that everyone has a job in private industry or Government work or aid; Senate 1349 and House 3914 raises the present 40 cent wage-hour minimum to 65 cents; Senate 1050 and House 3293 extends and increases present social security coverage; and Senate 1171 affects the status of the Wagner Act.

Government Ending War Research Pools Certificates permitting firms to pool their technical knowledge and research developments during the war are being revoked by the various Government agencies as the need for combination diminishes. Out of the total of 121 certificates issued during the war over 35 have already been revoked.

Controlled Materials Plan Has Expired The Controlled Materials Plan came to an end on September 30, 1945. All control over steel, copper and aluminum were eliminated. Control over tin, lead and antimony continues under their individual orders.

ELECTROLYTIC DETERMINATION OF COPPER AND ZINC

(*Concluded from page 458*)

weigh the electrode to determine copper. The weight of copper subtracted from that of brass gives the weight of zinc.

Procedure for Analysis of Brass Plate

Using a solution of cellulose acetate in ethyl acetate, mask off 10 sq. inches (65 sq. cm.) of plate area. Deliver the stripping solution from a buret and run it over this area to be stripped until the base metal is clean. Transfer the collected solution of copper and zinc to a 180-ml. electrolytic beaker and boil for 5 to 10 minutes to destroy per-sulfate. Add the sodium cyanide solution until the blue color of the copper-ammonia complex vanishes and then add 50 ml. of the supporting electrolyte. From this point on, proceed exactly as in the brass-plating solution analysis.

Interferences

Since the ordinary brass-plating bath contains traces of certain metallic impurities and up to 2 grams of sodium ferrocyanide per liter, the influence of these substances on the accuracy of the method was checked. Ten milligrams of the metal or radical under study were added as a sodium salt to 10 ml. of a stock brass-plating solution and the recommended electrolytic procedure was followed (Table I).

It is clear from Table I that accurate results cannot be expected in the presence of lead, arsenic, antimony, tin, or nickel. When the plating characteristics of the bath point to a possible metallic contamination, a direct chemical analysis for the impurity becomes necessary. Such cases are, however, rare.

Discussion

In the development of the present procedure, the aim was to find a suitable means of freeing copper and zinc in the brass-plating bath from their more stable complexes and converting these metals into complexes permitting rapid yet quantitative deposition of brass. In the search for a suitable electrolyte it was found that ammonium hydroxide speeded the deposition of brass. However, because of the rapidity with which the ammonia was driven out of solution by heating and gas evolution at the electrode, it was not satisfactory. Consequently experiments were made with other water-soluble amino compounds: 2-amino-1-butanol, hydroxylammonium sulfate, glycine, sulfanilic acid, ethanolamine, diethanolamine, and triethanolamine. Of these compounds, ethanolamine gave the best deposit and the most consistent results. All these compounds gave denser and brighter plates than does ammonia.

A further large increase in the speed of deposition was accomplished through heating to 80° to 90° C., electrolyzing at a high current density, and using a large concentration of ammonium sulfate, the latter salt serving largely to decompose any free sodium cyanide in the solution. With this combination of electrolyte and plating conditions, the deposition of brass can be made extremely rapid. To illustrate the speed of deposition by the present procedure, four 10-ml. samples of a stock brass-plating solution were electrolyzed for 5, 7½, 10, and 15 minutes, respectively. Of the 0.2387 gram of brass contained in each, the amounts remaining undeposited at the interruption of plating were, respectively, 0.0263, 0.0138, 0.0007, and 0.000 gram. Thus without undue haste on the part of the analyst, the copper and zinc content of a brass-plating bath (or the copper-zinc ratio of a brass plate) can be readily determined in 45 minutes.

Perhaps the greatest disadvantage encountered is that some hydrocyanic acid is evolved during the electrolysis. However, experience has shown that if the electrolytic machines are placed in or close to a hood in a well-ventilated room, the method presents no hazard from cyanide fumes.

The precision and accuracy of the method are satisfactory. The average weights of copper and zinc for twenty-five 10-ml. samples of standard brass solution were 0.2210 and 0.0169 gram, respectively, and the average deviation was ±0.0003 gram for both copper and zinc. The solution was standardized by the methods of Miceli and Larson (*1*) and was found to contain 0.2211 gram of copper and 0.0167 gram of zinc per ml.

While the method is hardly an umpire method, it has been found entirely satisfactory for production and experimental control work. The simplicity of the technique involved is also of benefit, especially when the analyses are turned over to a new operator.

Acknowledgments

The authors are grateful to V. F. Felicetta and C. A. Ihrcke for their contributions to the procedure during its many months of use. Thanks are also extended to the United States Rubber Company for permission to publish the work.

Literature Cited

(1) Miceli, A. S., and Larson, I. O., Ind. Eng. Chem., Anal. Ed. 16, 165 (1944).
(2) Verdin, F. I., *Zavodskaya Lab.*, 10, 648 (1941).

Keystone Brush

RECOMMENDATIONS ARE BASED ON . . . TYPE OF EQUIPMENT *And* OPERATING CONDITIONS

KEYSTONE Brushes constitute a complete line, with every type and size from fractional horse power to giant generator, and with combinations of materials necessary to meet any given operating condition.

But a brush selected wholly on "type and size" may not solve your problem. Extremely small variations are frequently present in electrical mechanisms identical in design. These variants may arise in manufacture, or be due to service conditions, deterioration, overload, etc. But however small, they may necessitate brushes of equally small differentiating character if maximum efficiency is desired.

To select the right brush is therefore not merely a matter of size and type. It is necessary also to consider the characteristics of the component materials, metal and graphite, and from an infinite number of possible combinations to select ONE that solves the problem—work in which Keystone Engineers are expert.

Keystone can meet your brush requirements, whether regular or special, with unsurpassed quality. In the case of special work, describe the trouble to be corrected, give manufacturer's data on your equipment, its wear condition, kind of work on which it is engaged, etc. Keystone Engineers will give you every assistance in finding the right brush.

WRITE FOR LITERATURE ON BRUSHES

KEYSTONE CARBON COMPANY, INC.

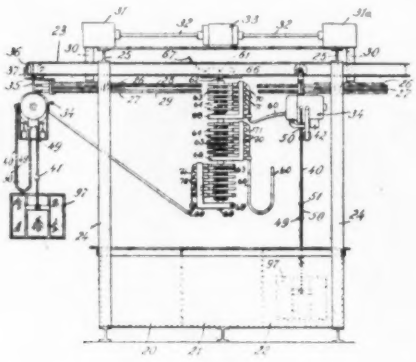
Manufacturers of Precision Molded Products

1935 STATE STREET, SAINT MARYS, PENNA.

Patents

Conveyor

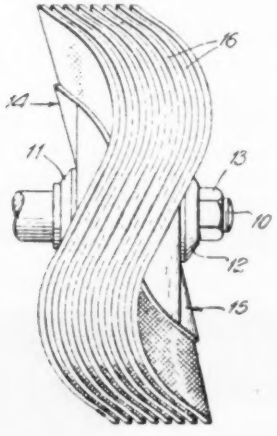
U. S. Pat. 2,382,194. O. W. Wood, assignor to The Plating Products Co., Aug. 14, 1945.



An apparatus for handling articles to be treated which comprises a track, a hoist movable along the track and provided with means for attachment to an article, a motor on the hoist operable to raise and lower the attachment means and article, means for supplying current to the motor throughout the movement of the hoist along the track, a reversing switch on the hoist for controlling the supply of current to the motor to cause it to operate for raising and lowering, electrical means on the hoist for operating the switch, a traveling element movable along the track, means on the hoist for connecting the hoist to the element to be moved along the track thereby, and program means for controlling the switch operating and the connecting means.

Buffing Wheel

U. S. Pat. 2,384,599. B. C. Case, assignor to Hanson-Van Winkle-Munning Co., Sept. 11, 1945. A plurality of sections preformed for registered assembly in forming waved rotary buffing and polishing wheels, each section being in the form of a flat centrally-perforated peripherally-continuous flexible disk of gen-



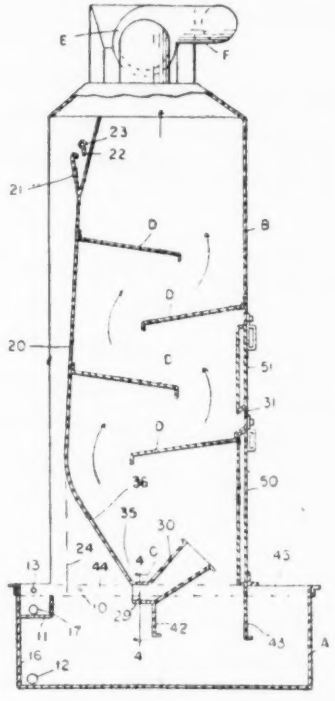
erally circular outline with convexly-contoured radial protrusions uniformly spaced around the circumference, and having means for registering it circumferentially with respect to adjacent sections.

Corrosion Prevention of Magnesium

U. S. Pat. 2,382,702. G. Elssner and E. Schroder (Germany), vested in the Alien Property Custodian, Aug. 14, 1945. In a process of providing articles of magnesium with an oxidic layer by anodic treatment in electrolytes and subsequent treatment with an impregnating medium that improvement which consists in the step of subjecting the articles to the action of a solution composed of about 200 grams of ammonium chloride per liter of water, in the absence of an electric current prior to the anodic oxidation.

Air Cleaner

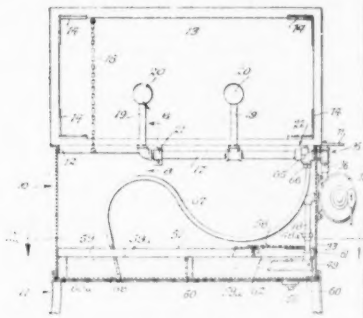
U. S. Pat. 2,383,138. J. E. Ludwig, Sr., assignor to David-Ludwig Co., Aug. 21, 1945. In an apparatus for removing particles from particle laden air, the combination with a tank for water, an upright casing rising from said tank, the lower end portion of one up-



right wall of said casing inclining inwardly toward the center of said casing, and means for maintaining the water in said tank at a predetermined level, of means at the lower end of the inwardly inclined end portion of said casing forming an open ended imperforate duct through which particle laden air from outside the casing may enter said casing, the inlet end portion of said duct being substantially straight and being partially submerged in water in the tank so that said inlet portion will constantly contain water to be commingled in said duct with particle laden air passing therethrough, the outlet end portion of said duct being also substantially straight, said outlet portion inclining upwardly from said inlet portion and discharging toward an opposite upright wall of said casing, means carried by said upright casing above said duct for creating suction in said duct so that particle laden air will be drawn through the duct into the casing and water in the inlet portion of the duct will be drawn upwardly in said duct to be commingled with the particle laden air as it is drawn thro the duct as aforesaid, and means cooperati with the duct to prevent particles floating the water in the tank in rear of said d from reaching the area of water in front the inlet end portion of said duct, includi a substantially verticle baffle projecting do within the water in the tank from the und side of said duct and terminating short the bottom of said tank.

Spray Cleaner

U. S. Pat. 2,385,150. A. E. Miller, assig to Visco-Meter Corp., Sept. 18, 1945. A u tary washing machine for the removal dirt, grease, oil, and the like from engine a other automobile parts comprising a ta having a perforated false bottom in a h zontal plane upon which the parts to cleaned are supported, the space below false bottom constituting a reservoir for cleaning fluid, a motor driven pump mount externally upon a wall of the tank, and hav an inlet pipe connection to said reservoir a an outlet pipe connection terminating ex nally of the tank, two pipe connections tending through a wall of the tank, a va casing connected to the outlet connection the pump and said two pipe connections valve in said casing for establishing, at w communication between the outlet connec



of said pump and either of the said two p connections, a pipe within the tank loca suitably above said false bottom and equip with means for spraying cleaning fluid u the parts supported upon said false bott a coupling between said pipe and one of s pipe connections, said coupling including swivel joint to permit turning movement said pipe upon its axis in order that spraying means may be positioned for op tion or placed in a non-operative position which the parts upon which the cleaning fl acts may be placed upon or removed fr said false bottom, a flexible hose within tank connected to the other of said two p connections, and a discharge nozzle carr by said hose at its free end, the discha nozzle being available to direct a conc trated jet of cleaning fluid upon any of parts supported upon said false bottom.

Zinc Solution

U. S. Pat. 2,384,300. C. G. Harford, signor to Arthur D. Little, Inc., Sept. 4, 19 A process of electrolysis that compr electro-depositing zinc from an undivided c containing an aqueous electrolyte consist essentially of a soluble salt of zinc and alkyl hydrocarbon diamine, and manifest a pH value between approximately 8 and

Bright Dip

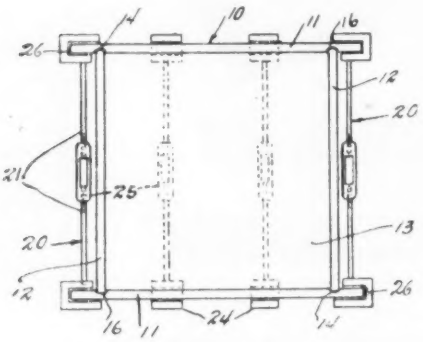
U. S. Pat. 2,382,865. H. R. Dittmar, assignor to E. I. duPont de Nemours & Co., Aug. 14, 1945. A process for preserving the color of high copper-containing metals which comprises dipping a metal containing at least 40% copper into an aqueous glycolic acid bath.

Abrasive Material

U. S. Pat. 2,383,933. F. R. Perry, Sept. 4, 1945. A process for preparing whole grain wheat to make a mild abrasive material adapted for use in air blast cleaning of metals consisting of the steps of cooking the wheat with water at boiling temperature for a period of approximately one to two hours, drying the cooked wheat to a moisture content of substantially five per cent and cutting the dried product into granules of a convenient size for use.

Glass Tank

U. S. Pat. 2,385,954. M. S. Tarnopol, assignor to Pittsburgh Plate Glass Co., Oct. 2, 1945. In a corrosion resisting tank, opposite plate glass side walls, opposite plate glass end walls, and a plate glass bottom, the several glass plates at their junction with one another having interfitting groove and edge connections, sealing material at the junction



of the groove and edge connections to produce fluid-tight joints, pairs of metal U-clamps fitting around edge portions of the plates along the sides and bottom of the tank, clamps of each pair being disposed in opposed relation on opposite walls of the tank, yieldable cushioning material disposed in each clamp between the inner surface thereof and the surface of the glass plate on which it is mounted to insulate metal clamping material from the glass, and a tie rod including a turnbuckle connecting the inner sides of clamps of each pair inwardly of the adjacent glass edges and holding the glass plates in assembled relation with the groove fitting edges thereof pressed in fluid-tight relation in their receiving grooves.

Detergent Mixture

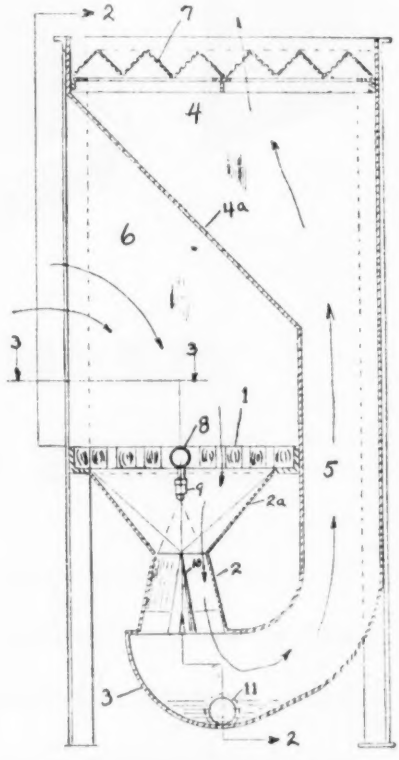
U. S. Pat. 2,383,114. T. E. D'Villiers, assignor to Cities Service Oil Co., Aug. 21, 1945. A detergent mixture comprising approximately 30% of orthodichlorbenzene, approximately 20% of ethylene glycol monobutyl ether, approximately 15% glycerin, approximately 7% of water, the remainder of the mixture consisting essentially of an ethanolamine oleate soap.

Vitreous Coating

U. S. Pat. 2,385,573. O. Hommel, assignor to The O. Hommel Co., Sept. 25, 1945. The refinement herein described of the production of enamelware by spreading successively and drying successively two superposed layers of slip and firing the whole, which consists in including in the composition of the slip of the nether layer a content of 2-10% of silicate of soda, whereby blistering in the ultimate firing of the article is prevented.

Grinding and Polishing Booth

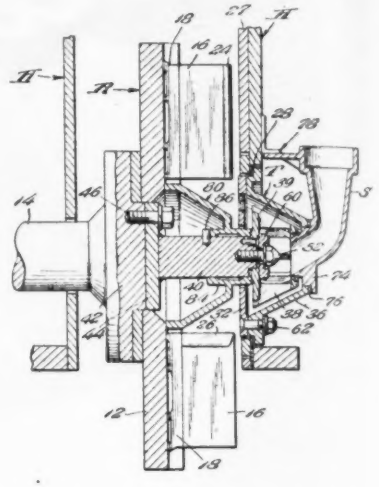
U. S. Pat. 2,384,991. E. F. Fisher, assignor to Whiting Corp., Sept. 18, 1945. A grinding and polishing booth, comprising a grilled table for supporting an article being ground or polished, a Venturi-shaped dust collecting passage directly below said grilled table, the upper edges of the walls of said passage being connected with the outer edges of the grilled table, a sludge chamber below the



exit end of the venturi, downwardly directed, suction creating nozzle means directly below said grilled table, for spraying liquid directly into the throat of the venturi, and projecting wetted dust, drawn through the grilled table by the suction, directly into said sludge chamber, and a laterally and upwardly extending passageway for carrying away air and spray deflected from the liquid surface in the sludge chamber.

Abrasive Blasting

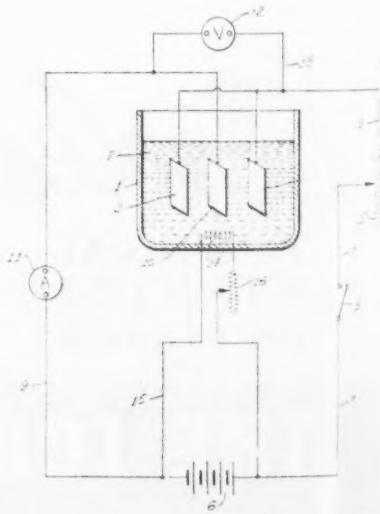
U. S. Pat. 2,385,728. P. J. Potter, assignor to Pangborn Corp., Sept. 25, 1945. In centrifugal abrading apparatus, a rotor including a plurality of substantially radially arranged propeller blades terminating inwardly short of the axis of the rotor, a housing including a portion arranged over the face of said rotor, said housing having an opening therein adjacent the axis of the rotor, a normally stationary frusto conical shaped control cage, a removable end member secured to the larger diameter end of said cage, means supporting the control cage with the end member closing the opening in the housing and with the cage portion extending outwardly from the housing, a feed spout guiding



abrasive into the smaller end of the frusto conical cage, said end member having a discharge opening therein of limited cross sectional area radially displaced from the axis of the rotor, and means for moving abrasive from said cage through said discharge opening into the path described by the inner ends of said propeller blades.

Electropolishing Bath

U. S. Pat. 2,386,078. S. M. Weisberg and I. Levin, assignors to Sealtest, Inc., Oct. 2, 1945. An electro-chemical polishing bath comprising essentially between about five and thirty per cent sulfuric acid, between about fifteen and forty per cent lactic acid, between about thirty-five and sixty per cent of phosphoric acid, and between about two and



twenty per cent of water, all proportions being by weight calculated on the basis of 100% concentrations of said acids.

(*Continued on page* 476)

PUT *Beckman* pH CONTROL TO WORK IN *YOUR* PLANT

1. INCREASING PLATING SPEEDS
2. REDUCING COSTLY "REJECTS"
3. PRODUCING SMOOTHER COATINGS
4. IMPROVING PLATING EFFICIENCIES

By Beckman-controlling the pH of your plating processes you can make FOUR important savings in your plant operations . . . *vital* savings that mean higher quality platings at substantially lower operating costs . . .

1. By closely controlling the pH of your plating baths you can generally operate at higher current densities without risk of faulty coatings. This means faster plating, reduced costs. *And remember—Beckman is the only pH equipment that will accurately control alkaline plating operations such as cadmium, zinc, brass, etc.!*

2. The controlled-coatings produced by Beckman-regulated plating baths minimize blistering, peeling and off-color deposits, thus greatly reducing "rejects" and costly waste of time and materials.

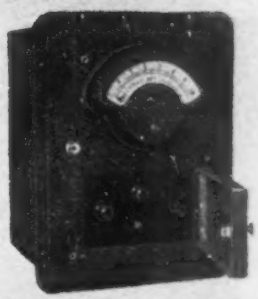
3. Not only are blistering and peeling practically eliminated, but Beckman-controlled coatings are far more uniform and smoother, insuring highest quality platings on run after run.

4. And because Beckman-controlled plating processes are simple to handle and uniformly effective at all times, even inexperienced plant workers can turn out consistently top-quality plating jobs with minimum loss. Over-all plant efficiencies are greatly increased!

LET US HELP YOU take full advantage of the multiple savings possible through Beckman pH Control. Our engineering staff will gladly make recommendations to fit your particular requirements.

NATIONAL TECHNICAL LABORATORIES
SOUTH PASADENA • CALIFORNIA

WORLD'S LARGEST MANUFACTURER OF GLASS ELECTRODE pH EQUIPMENT



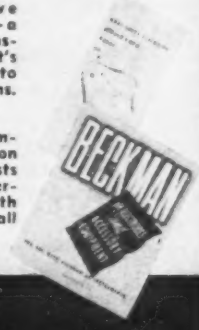
The Beckman Automatic pH indicator is the most advanced pH instrument available today. Incorporates many unique features found in no other make or type of equipment. Operates standard control and recording equipment. Ask for Bulletin 16!

The Beckman Industrial pH Meter is ideal for portable plant and field use. Simple, quick, accurate. May be used with Beckman Flow Type and Immersion Type Electrode Assemblies for maintaining pH check on solutions in process. Ask for Bulletin 21!

SEND FOR YOUR COPY OF THESE HELPFUL BECKMAN BOOKLETS!

"What Every Executive Should Know About pH"—a simple, non-technical discussion of what pH is, how it's used, and its importance to modern industrial operations.

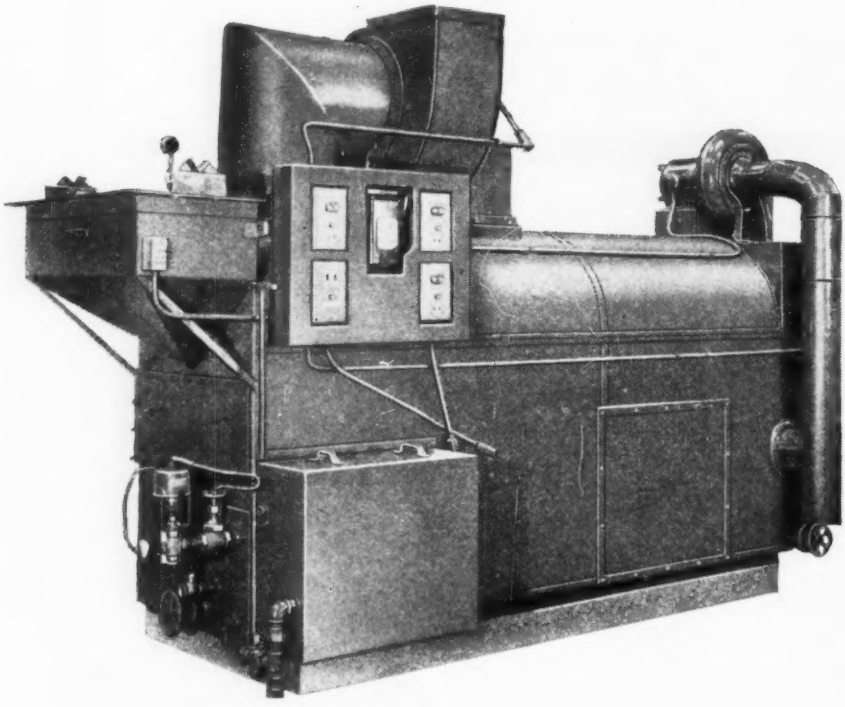
Bulletin 86—The most complete catalog available on modern pH equipment. Lists and describes over 60 different electrodes together with accessory equipment for all types of applications.



Beckman **THE LEADING NAME IN pH**

NEW EQUIPMENT AND SUPPLIES

NEW PROCESSES, MATERIALS AND EQUIPMENT FOR THE METAL INDUSTRY



Rinsing and Drying Machine

A new machine especially designed for the rinsing and drying of screw machine or small stamped parts, has been announced by Optimus Equipment Co., Dept. MF, 129 Church St., Matawan, N. J., manufacturers of equipment for the washing, rinsing, pickling and drying of metal parts.

The Optimus Screw-Drum Type Machine is versatile in its applications. It can be used for washing and drying, or rinsing and drying, or any part of these operations. It is also adaptable to a wash-drain, rinse-drain, cold or hot air dry operation sequence.

Ideal for very difficult rinsing and drying jobs, this equipment can also be adapted for pickling operations. The air steam passes through heater and blower providing for either or both cold and hot air blast system. Air loss is avoided by completely enclosed dryer end.

The various parts of the machine are readily accessible for lubrication, maintenance, or alterations and cleaning such as might be required in hard water areas. Centralized lubrication may be provided.

"Low-Swing" Strainer

Several improvements over existing equipment are claimed for a new Blackmer strainer recently announced by J. B. Trotman, General Sales Manager of the Blackmer Pump Company, Dept. MF, Grand Rapids, Mich.

Developed by Blackmer engineers as a wartime protective and conservation measure for critical pumping equipment, the new Low-Swing strainer has been added to the company's line of Ezy-Kleen strainers and is now available for reasonably prompt delivery.

The following advantages appear from field reports on the new strainer:

1. Use of perforated metal, steel or bronze, instead of wire screen for the strainer basket makes the basket less liable to damage in cleaning and gives it longer life.

2. Slotted lugs of the top plate line up with the lugs of the strainer body to receive the four holding bolts. This permits quicker removal of basket for cleaning.

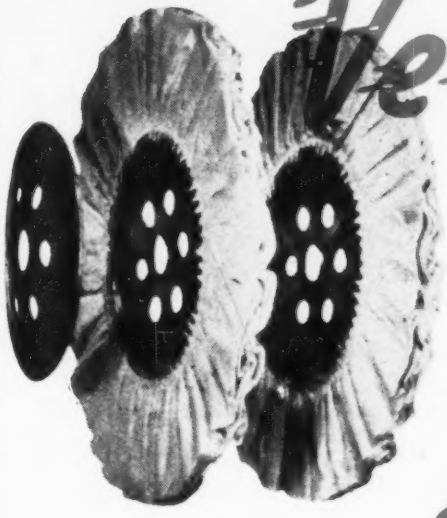
3. Compact design permits mounting in small space or in lines along walls.

4. Strainer is designed for flange mounting. Companion flanges are included as a part of the unit.

Present production is limited to a capacity of 100 GPM with 2-in., 2½-in., and 3-in., intake and discharge sizes. Maximum operating temperature is 600°F. Maximum pressure is 75 psi. Larger and smaller sizes will eventually be added to the line.

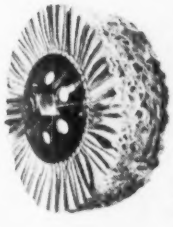
The Atomic Bomb BLASTED THE JAPS OUT OF THE WAR!
AIR-WAY Ventilated BUFFS BLAST ANTIQUATED BUFFS
OUT OF POLISHING ROOMS!

AIRWAY BUFFS *Ventilated*



SAVE 50% on your COTTON BUFF WHEEL COSTS

Challenge our Claim—***WE CAN PROVE IT!***



AIRWAY *Ventilated* **BUFFS**—improved and perfected for vital war work—do better work faster and wear twice as long; they are now available for peace time production. Constructed in many different types. A wheel for every requirement.

AIRWAY *Ventilated* **BUFFS** save you 50%. Don't be a non-believer. Make us prove it by comparative tests. Write today and state your requirements.

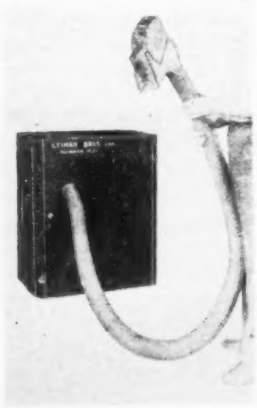
WARNING NOTICE— Jackson Buff Corporation of Long Island City, New York, has rights to U. S. Patents Nos: Re 19,894 and 2,140,208 which have broad claims covering an air cooled buff having means for the admission of air through the sides of the buff. Owner intends to protect all rights and stop infringement.

JACKSON BUFF CORPORATION

21-03 41st Avenue, Long Island City, N. Y.

New Dust Collector

Leiman Bros.' newly designed dust collector is one employing the centrifugal vortex principle, whereby the powerful air suction draws the dust through the flexible hose and hood provided and into the interior of the cabinet, which contains a circular conical shaped cyclone tank.



The rapid spinning of the air forces the dust particles to the center of this mass of spinning air, and its gravity drops it to the bottom and into a dust receptacle, where it may be quickly and easily removed.

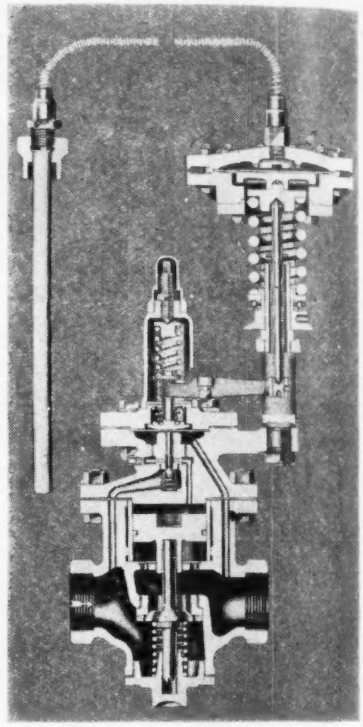
As the center of this whirling mass of air is almost pure dust, the outer edge of the mass is almost pure air separated from the dust—and being rid of the dust and consequently being that much lighter, it floats out through the fine fiberglass filter top of the cabinet and is free to recirculate into the air of the room.

Free information will be gladly furnished if you will drop a card or letter to Leiman Bros., Inc., Dept. MF, 106-80 Christie St., Newark 5, N. J.

Temperature Regulator

A self-contained, spring loaded, internal pilot, piston operated Temperature Regulator for steam service, has been announced by Leslie Co., Dept. MF, 145 Delafield Ave., Lyndhurst, N. J., makers of regulators, controllers and whistles.

A prominent feature of the new Regulator is Duo-Matic Control, whereby both accurate temperature regulation and pressure control are obtained simultaneously with a single regulator. Piping is thus simplified and installation costs materially reduced.



The new Regulator has a wide range rugged thermostatic element with 100°F. adjustable temperature range. It is single seated for positive dead-end control. It is equipped with metal diaphragms, has no bellows or packing glands. Leaks are eliminated and minimum attention is required.

All wearing parts are renewable. 100% interchangeability allows complete overhaul without removal from the pipe line. Corrosion and wear resistance is obtained with the use of stainless steel hardened wearing parts. Vital parts are hardened to at least 500 Brinell.

A vapor filled thermostatic element acting through the upper diaphragm and lever opposes pressure limit spring and determines the steam pressure delivered by regulator to heat exchanger. Manual compression of the limit spring determines maximum outlet pressure and opens controlling valve admitting high pressure steam from inlet body port to top of piston which opens main valve. The outlet steam pressure acting under steam diaphragm balances compression of limit spring, throttling controlling valve and limiting the maximum outlet pressure.

The temperature at which the vapor pres-

sure starts to oppose the limit spring and decrease outlet steam pressure is set on the adjusting spring. This spring opposes the vapor pressure through the large upper diaphragm and by means of this spring the temperature at which all steam to heater will be shut off can be accurately set.

A temperature drop of 1°F. at bulb reduces vapor pressure, allowing limit spring to open controlling valve and deliver an increased steam pressure to heat exchanger.

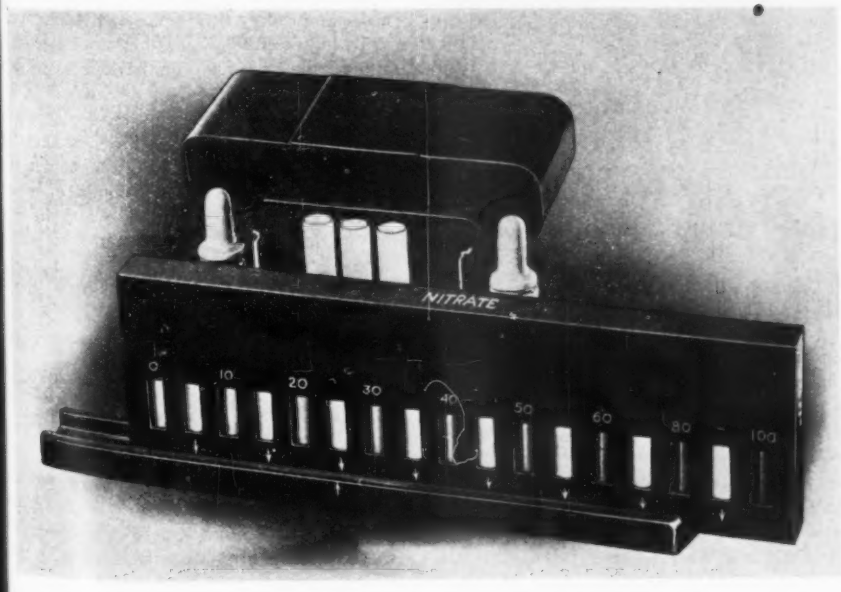
Therefore, outlet steam pressure is always directly proportional to the change in temperature at bulb and this pressure is automatically maintained regardless of the volume of steam used by heater or variations in supply pressure.

Nitrate Slide Comparator

Designed to determine nitrate concentration of boiler water where nitrate-hydroxide ratios are maintained to control tendencies toward caustic embrittlement. The method was developed in the laboratory of W. H. & L. D. Betz, Philadelphia, Pa., and adapted to the Taylor Slide Comparator by W. A. Taylor & Co., Dept. MF, 7300 York Road, Baltimore 4, Md., who are marketing the outfit.

The set consists of a Taylor pH Slide Comparator base, a color standard slide with 9 standards representing 0, 10, 20, 30, 40, 50, 60, 80, 100 ppm of nitrate as NO_3, five 5ml test tubes, 2 vials of Brucine reagent, pipette, 16 oz. concentrated sulfuric acid, 10ml graduate and 100ml beaker. The slide can be used on any Taylor pH or Phosphate Comparator base. A determination is made by placing 5ml of the boiler water in the beaker and adding measured quantities of Brucine and sulfuric acid. Five minutes after mixing, 10ml of distilled water is added. A yellow color develops, the intensity of which is proportional to the nitrate content. A sample of the yellow mixture is placed in one of the 5ml test tubes in the base and the color compared with the standards. If the nitrate content is higher than 100 ppm NO_3, the boiler water can be diluted with nitrate free water to bring it within the range of the Comparator.

The accuracy of the method is not affected by ions normally present in boiler water such as phosphates, sulfites, silicates, chlorides, etc.



Industrial Apron

A light duty industrial apron to give maximum protection against oil, which is also acid, caustic and waterproof is announced by The B. F. Goodrich Co. It is double coated by the calender method with Ameripol, the company's exclusive type of synthetic rubber.

Made in two sizes, 29 by 35 inches and 34 by 45 inches, it is constructed with hemmed edges and attached neck and waist tapes. It is suitable for use on light assembly and bench work in machine shops, tanneries, dairies, chemical plants, laboratories

and other applications where a lightweight garment is needed to protect a worker from acid, oil, caustic or water.

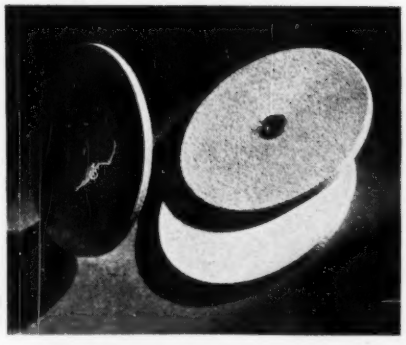
The garment was thoroughly pre-tested with all mineral and vegetable oils, including cutting, lubricating and machine oil. It is also impervious to gasoline and benzol. It is unaffected by 24 hours complete immersion in 50 per cent concentrations of sulphuric, nitric and hydrochloric acids, and 25 per cent solution of caustic soda.

The garment also has a very high abrasion resistance.

Further information may be obtained by writing to The B. F. Goodrich Co., Dept. MF, Akron, Ohio.

Refacing Stone for Abraser

The Taber Instrument Corp., North Tonawanda, N. Y., manufacturers of the Taber Abraser, announce a new Duplex Refacing Stone for their Calibrase Wheels. The Abraser is a testing instrument for determining



the rate of wear or abrasion resistance of a wide range of materials. The wearing action is performed by dual Calibrase Wheels bearing against the specimen under constant pressure, revolving in opposite directions, one sliding radially toward the outside, the other sliding toward the inside of the wear path. To maintain a uniform wearing action the Calibrase Wheels are refaced at stated intervals. Abrasive coated paper discs were formerly used for this purpose and have now been replaced by the new Duplex Refacing Stone.

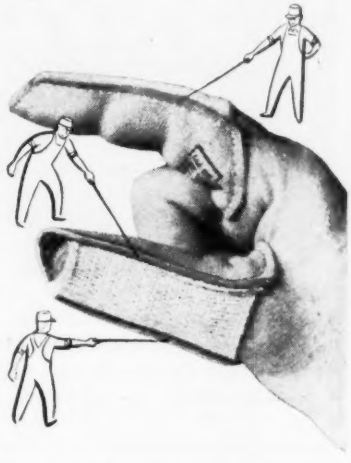
One side of the Stone is a coarse grit for refacing the wheels at the start of a test and the other side is a fine grit used at intervals during a test. The advantage claimed by the manufacturer for the Duplex Refacing Stone is improved control of the Calibrase wheel surfaces by eliminating or minimizing the possibility of picking up additional grit, thus assuring standardization of the wheels. The Duplex Refacing Stone will also be more economical as its wear-life will be much longer than the former abrasive coated paper discs.

For further information regarding this new development for the Taber Abraser, write Taber Instrument Corp., Dept. MF, 111 Goundry St., North Towanda, N. Y.

Steel-Grip Fingerguard

Illustration shows practical protection of thumb and finger for buffing, polishing, grinding, punch press and assembly work, inspection, sanding, etc.

The original Steel-Grip Fingerguard introduced about three years ago by Industrial Gloves Co., Dept. MF, Danville, Ill., has



definitely established the effectiveness of this type of guard: a leather working face with cool comfortably fitting elastic webbing back.

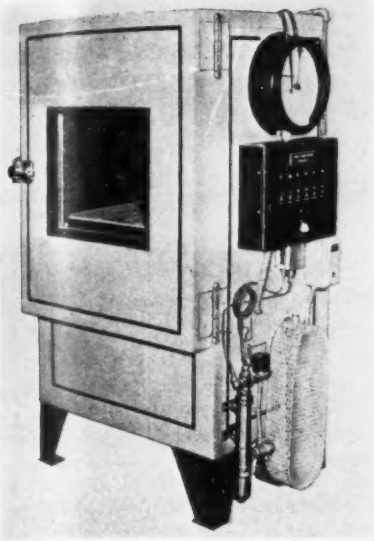
An improved fingerguard is now made available by the manufacturers in their new Supergard as illustrated.

In this new construction, the leather wearing surface extends two-thirds around the finger, thus giving added protection to the wearer. Also, there are more hours of service in the new Supergard as the seams are well up on the sides of the finger and out of the wearing zone.

The Supergard comes in three sizes—Small, Medium and Large—and in three materials—Cowhide Split, Grain Leather and Lightweight Capeskin.

Insulated Temperature and Humidity Chamber

A new Insulated Variable Temperature and Humidity Chamber for the simulation and control of atmospheric conditions has been announced by Tenney Engineering, Inc.



Dept. MF, 26 Avenue B, Newark 5, N. J., makers of automatic temperature humidity and pressure control equipment.

Cabinets are scientifically designed to provide accurate simulation and control of any desired temperature, humidity and air circulation condition in laboratory or production testing operations. Simple and fool-proof in construction. Batches or parts can be tested under standard or variable conditions. Temperature, humidity and air circulation can be controlled to close pre-selected limits.

Conditioned air is kept in continuous forced circulation without undesirable draft. Uniform wet and dry bulb temperatures throughout the cabinet are thus provided.

Dry bulb temperature of the air can be set from room temperature to any desired point. When unit is operating, this temperature does not vary in any part of cabinet by over 1° C. plus or minus.

Relative humidity can be controlled up to 90% and atmosphere will not vary over plus or minus ½° C. from the wet bulb of the humidity required.

Glass doors permit inspection of contents without exposure of same to outside air. Under any set conditions, temperature and humidity will remain constant during operation. A simple resetting of controls brings cabinet to a new equilibrium within ten to fifteen minutes.

Available in laboratory and production sizes.

Profilometer Tracer

The range of surfaces on which roughness measurements can now be taken is greatly increased by the introduction of the new Type AW Profilometer Tracer by Physicists Research Co., Ann Arbor, Mich. Used in conjunction with the Profilometer, the Type AW Tracer greatly increases the versatility, efficiency, and convenience with which Profilometer measurements may be made.

No adaptations of the equipment are necessary to use the Type AW Tracer with all types of Profilometers now in use. Complete information regarding the Profilometer may be had on request from Physicists Research Co., Dept. MF 13, Ann Arbor, Mich.

SHOP PROBLEMS

PLATING AND FINISHING
POLISHING — BUFFING
CLEANING — PICKLING
HOT DIP FINISHES

METAL FINISHING publishes, each month, a portion of the inquiries answered as a service to subscribers. If any reader disagrees with the answers or knows of better or more information on the problem discussed, the information will be gratefully received and the sender's name will be kept confidential, if desired.

Corrosion of Bronze

Question: Our head office building is located in such a position that the smoke, and coal dust from passing trains seem to have an effect on the heavy bronze grilles and entrance doors aided, of course, by the usual effects of the weather. The continual maintenance of these doors is a very expensive item, and it has occurred to us that after they have been put in proper condition there might be some protective lacquer or something similar which would eliminate the constant work which is now necessary to keep them presentable.

J. L. W.

Answer: A few coats of a good protective lacquer should solve this problem, and we would suggest that you communicate with lacquer manufacturers.

Stop-Offs

Question: We desire information concerning localized nitriding of fairly large parts (approx. 50 lbs.).

If tin plating is used as a "stop-off" for the nitriding, what is best stop-off for tin plating to give a sharp line between the hard and soft area?

What material is best for preventing nitriding in threaded holes other than plating with tin or copper?

J. L. W.

Answer: We would suggest that you communicate with manufacturers of stop-off lacquers, a list of which is enclosed herewith from our 1945 *Directory*.

The best procedure for preventing nitriding in threaded holes other than plating with tin or copper is to plug the threaded holes with screw plugs.

Barrel Burnishing

Question: Can you supply me with a book, having complete and detailed information on the burnishing of all types of metals?

S. A. M.

Answer: We do not know of any books on this subject, but a rather complete section appears on pages 59-68 of the 1944 edition of *Plating and Finishing Guidebook*. Unfortunately, no more copies of this are available, and it will be necessary that you examine a copy in your local library.

Coatings for Lead Coils

Question: I would like to receive information as to what material I can use to cover a lead coil for use in a 10% hydrochloric acid solution at a temperature of 150° F. I am using a Haveg tank which is acid resistant.

T. F.

Answer: Any stop-off or rack coating lacquer can be used, but we do not think they will stand up in service. A carbon, silver, Durichlor or tantalum coil should be used. If the solution is to be used for pickling metals, the nascent hydrogen will probably result in corrosion of the tantalum, so that this material would not be suitable.

Copper & Silver Plating

Question: I plated for some time in the copper before I discovered that I was plating off the tanks.

The copper is plating a very brown color. It seems as though there is lead in the solution. I find that by trying to give this copper a 24 k. gold plate, it doesn't plate properly.

Please advise if I should make a new copper solution, and if it will be affected in lead lined tanks.

Do cyanide solutions have any effect on lead lined tanks?

G. E. D.

Answer: Lead lined tanks are not suitable for cyanide solutions, as lead will be dissolved, contaminating them. The lead may be removed by plating on scrap cathodes at low current density after the source of contamination has been eliminated.

We would suggest that you use unlined steel tanks, or, in the case of silver, a glass or asphalt lining may be applied.

Stripping Brass

Question: Do you know of any method available to strip defective cyanide brass plate from zinc alloy die castings without pitting the basis metal?

W. A. C.

Answer: Try a chromic acid strip, an example of which is as follows:

Chromic acid	4 lbs./gal.
Sulfuric acid	4 oz./gal.

Stripping Nickel

Question: Please send us a formula for stripping nickel from small parts. We plate these parts in a barrel. The cost would be too high to rack these parts for stripping and we would like to find some other method.

J. S. N.

Answer: If the base is iron, the best way to remove the nickel will be immersion in fuming nitric acid. There is no satisfactory method for removing nickel deposits from brass in bulk but if the deposits are very thin, the nickel may be removed in a bright dip without excessive attack of the brass.

Coloring Aluminum

Question: Please find attached herewith samples of aluminum poultry leg bands.

We have to color some of these bands for the identification of the different races of poultry and would appreciate the favor if you will recommend a firm who can supply such coating material that is easy to apply and will resist weather and abrasion.

We would prefer having green color, but we would accept any other color.

C. R.

Answer: Only anodizing followed by dyeing will resist weather and abrasion. You have a choice of performing these operations on the finished bands, which can be done by job plating plants so equipped, or you may be able to obtain strip which is already anodized and dyed.

We suggest that you communicate with the Aluminum Company of America, Pittsburgh, as they may know of companies who can provide you with the finished strip.

Removing Cutting Oil

Question: In the operation of our high speed punch presses, we apply the cutting oil to the strip as fed into the press by means of a web covered roller riding in a pool of oil and carrying same to the strip.

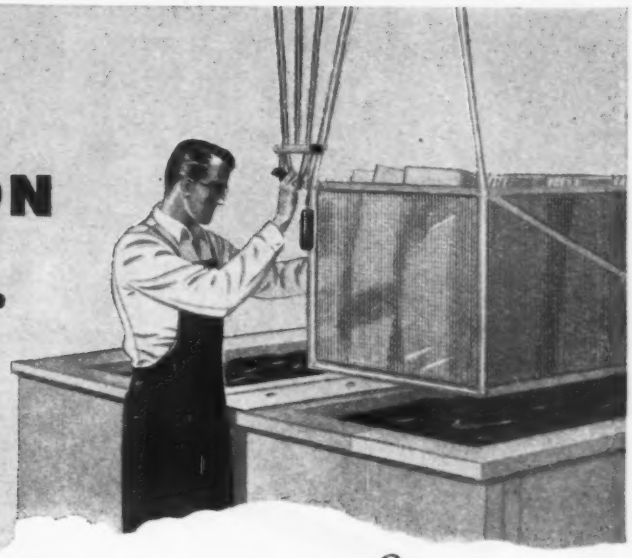
Our method of removing the oil from the finished product is to put a quantity of same in a tumbler along with about the same quantity of sawdust and revolve for approximately 30 minutes, then put them through a separator tumbler.

We would be very interested in learning some of the ways that other manufacturers do the above job.

W. N. J.

Answer: The usual procedure is to use a solvent degreaser with trichlorethylene or tetrachlorethylene, both of which produce a dry finish. Another procedure is to use an emulsion type cleaner which may be obtained from any detergent manufacturer. This process requires subsequent rinsing.

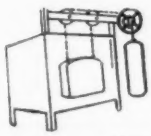
FOR SOAK TANK CLEANING OF IRON & STEEL PARTS...



Bumper-to-Bumper

DIVERSEY SERVICE FOR SOAK TANK CLEANING

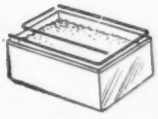
Typical operations where Diversey Service can be of material assistance . . .



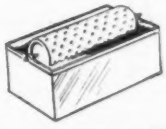
Cleaning prior to heat treat

Cleaning after oil quench

Cleaning prior to pickling



Soak cleaning prior to plating



Soak cleaning prior to electro-cleaning

Cleaning prior to inspection and assembly

Cleaning prior to rust prevention

Removing heavy duty rust inhibitors

GET *Bumper-to-Bumper* DIVERSEY SERVICE

Each cleaning operation presents a different problem . . . some simple, some extremely difficult. But no matter what the problem, a Diversey D-Man can usually provide the right answer with his "bumper-to-bumper" service. Even where soak tank operations seem to be going along smoothly, the Diversey D-Man can usually point out ways to get better results at lower operating costs.

Call in a Diversey D-Man today. Let him make a cost-free "bumper-to-bumper" check-up of your soak tank cleaning. It won't cost you a penny to find out what can and might be done to get better results. Just write Metal Industries Dept., The Diversey Corporation, 53 W. Jackson Blvd., Chicago 4, Ill.

AT YOUR SERVICE

DIVERSEY D-MAN

DIVERSEY DC-22... *For soak tank cleaning of iron and steel*

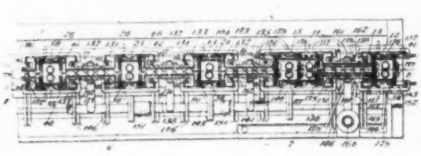
A vigorous, heavy duty cleaner, Diversey DC-22 quickly and completely removes all types of solid dirt, oil and grease from iron and steel. Maintains peak cleaning strength even with large amounts of contamination in the solution because of unusual reserve power. Vigorous cleaning action is made possible by superior saponifying, emulsifying, wetting and penetrating power. A dry product, completely soluble in water, DC-22 readily provides a solution of the required strength for tank cleaning.

Patents

(*Continued from page 466*)

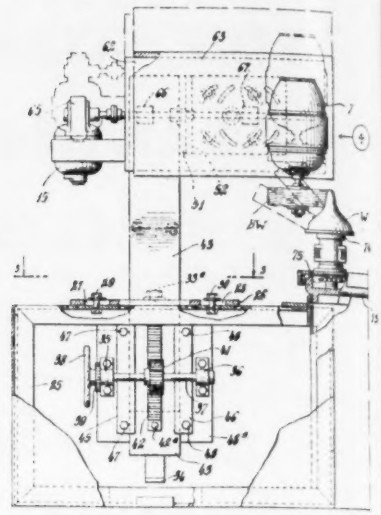
Electroplating Machine

U. S. Pat. 2,384,660. C. H. Ward, assignor to Bethlehem Steel Co., Sept. 11, 1945. An electrolytic apparatus for continuously treating sheets, comprising a plurality of plating cells and roll housing boxes containing an electrolyte arranged in longitudinal alignment in alternate relation to each other, an insulating panel between each plating cell and roll housing box each having a vertical central slot forming restricted passageways between the plating cells and the roll housing boxes through which the sheet can pass, means for securing each of the roll housing boxes to the adjacent ends of a pair of plating cells, a pair of contact rolls in each of the roll housing boxes adapted to engage the opposite sides of the sheet, liquid seals at the inlet and outlet ends of the apparatus, and means for rotating the pairs of contact rolls to advance the sheet submerged in the electrolyte through the plating cells and roll housing boxes.



Buffing Machine

U. S. Pat. 2,386,649. P. J. Belcourt, Oct. 9,



1945. In an automatic buffing machine, a bottom support frame, a post mounted in said frame and projecting upwardly out of the top thereof, a carriage for a motor-driven buffing wheel mounted for universal adjustment upon the top of said post, means within said frame for adjusting the elevation of said post, and other means in said frame for swinging said post within limits about a vertical axis.

Associations and Societies

American Electroplaters' Society

Los Angeles Branch

Los Angeles Branch of the *A. E. S.* took steps at its October 8 meeting, held at the Baux Cafe, Los Angeles, to bring about a resumption by the Board of Education of night school classes in chemistry as it applies to electrodeposition in the establishment of which courses the branch played a dominant role before the war.

Marcus Rynkofs, president of the *Liberty Plating Co.*, Hollywood, brought the subject before the meeting with the suggestion that the Board of Education be contacted in an effort to have such classes reinstated at an early date.

At the instigation of the Branch, the Board of Education established a night school class in chemistry at Polytechnic High School in 1940. Discontinuance of that prewar course was caused by a shortage of teaching personnel and not by a lack of attendance, Mr. Rynkofs pointed out. He stressed that this fact be called to the attention of the Board when the request for resumption of the course is made.

Mr. Rynkofs reported that the prewar class started with an enrollment of 40 and eventually stabilized with an average of 20 students a night, many of whom were members of the Branch or employees of Branch members. Emphasis was placed on chemistry.

Various members commented at the October meeting that the course in chemistry was particularly valuable to platers who had not had an opportunity to study chemistry in

college or high school. The night classes, they stated, affords an opportunity for such men to ground themselves in the aspects of chemistry that apply directly to the field of metal deposition.

The general opinion was condensed in the statement by one veteran plater, who remarked that "If platers do not take up chemistry, before long there will be no plating."

President *Ed Wells* appointed Mr. Rynkofs chairman of a committee which is to contact the Board of Education and submit the recommendation that the night classes be resumed at an early date.

E. R. Lamoureux announced that the *Lamoureux Award*, to be presented to the author of the best technical paper presented at a Branch meeting during the fiscal year, will again be in force this year. The existing Committee of Judges—*Earl Coffin, Don Bedwell* and *Clarence Thornton*—was reappointed by Mr. Lamoureux.

Mr. Lamoureux's generosity in founding and defraying all expenses of the Award Plan was warmly commented upon by various members. In previous years Mr. Lamoureux, who is Los Angeles Branch's only honorary life member of the Supreme Society, has presented to the annual winner a suitable plaque or trophy bearing the winner's name and the year the award was made.

Applications for active membership were received from *P. O. Frank* and *J. E. Inderer* of the Price-Pfister Co., and *Joseph LaVoie*, Precision Plating Co.; and for associate membership from *J. M. Bowman*, Paramount Film Studios; *J. C. Maier*, Los Angeles Plating Co., and *A. Offring*, L. H. Butcher Co.

Visitors introduced by Sergeant-at-Arms *Allie Sulzinger* included *Barker Woodland* and *Ray Steel* of Tool & Jig Plating Co.: *R. C. Koch* and *J. O. Powell*, Cannon Electric & Mfg. Co.; *Jack Raskin*, L. H. Butcher Co., Los Angeles, currently a member of Detroit Branch; *W. J. Wood*, DuPont Co.: *Odie Foster*, Lancaster, Pa., Branch, and *Dominick Janactu*, San Francisco.

The speaker of the evening was Branch Vice-President *D. N. Eldred*, representative of the Pacific Division, DuPont Co., El Monte, Calif. Mr. Eldred presented an informal talk on the potassium high-speed copper plating process, at the conclusion of which he offered himself as the target for a multitude of questions.

Detroit Branch

Nine new members this month. 154 present.

At the October meeting, *Bill Phillips*, the head of the electrochemistry department of *General Motors Research*, praised the platers for their wonderful accomplishments under great difficulties. They have lived up to a tough job, and deserve a medal for their good work. Now, we have another kind of job. Competition will set in; specifications are more severe; and there will still be shortages without priorities protection. Thickness of copper and nickel has changed from .001" of 20 years ago to a present requirement of .003" of combined copper, nickel, and chromium on some parts. There are stiffer specifications for cadmium and zinc. Some bolts and nuts require .0005"

Looking forward, he maintains that the platers must reduce the cost of plating. One way is in the wheel work, buffing and polishing; another can be in demanding better basis metal. The next five years should show the greatest advance in plating; and it will do so at no increase in cost to the customer. Also we should produce a brighter plate. Die castings will come in for attention along with plastics as an improved base for plate, he stressed. To prove his point, he brought out the fact that a man will pay $75.00 for a suit of clothes, and take good care of it; while he will pay $1200.00 for an automobile and let it take care of itself.

From the questions raised by members, it developed there is no need for silver in automobiles, as there was in aircraft motors. They do not get such severe punishment. Nor is there much chance for plastics to take the place of plating; each has its own functions. However, the platers had better watch stainless steel as a competitor. It has limitations now, but the manufacturers are working to eliminate them. The platers may escape this by improving their plate. To illustrate he brought out the humorous fact; there was stainless steel and rustless iron; the stain-

less steel was not stainless; and the rustless iron was not rustless; but the stainless steel would not rust.

On December 8, the Detroit Branch will hold its annual Educational session and party, at the Hotel Statler. We expect to equal any of the pre-War parties, and from present plans it should excel. "Boss" Kettering will start at 2 o'clock with an inspiring discussion of "Looking into the Future".

Dr. Walter Meyer will give a paper on "Finishing of Aluminum".

Dr. Carl Stockton, of Standard Steel Spring, will supervise a discussion led by the charming young lady who conducted the original research project. This interesting and unusual paper will take us into a venturesome place in the automobile industry.

Walter Pinner will have 8 to 10 minutes to tell us what has been happening since he has been president.

Dr. Carl Heussner, the head of our own research division will bring us up-to-date on the seven research projects we have under way.

Following the discussions we will have a dinner and dance. George Nankervis who is chairman of an able committee, has promised steaks of pre-War quality, the best stage show that Detroit can produce, a beautiful favor for each of the ladies, and dancing until two a.m., Sunday morning. Already the ticket sales look as if we could sell 2 or 3 times the 800 available.

We have been promised that Dr. A. Kenneth Graham will be the honorary chairman.

George A. Pillsbury.

American Section Society of Chemical Industry

Dr. Francis C. Frary, Director of Research of *Aluminum Company of America*, has been elected to receive the *Perkin Medal* in recognition of his outstanding accomplishments in the field of industrial research, it was announced recently by *Cyril S. Kimball*, secretary of the *American Section of the Society of Chemical Industry*. The presentation of the medal will take place at a dinner meeting of the society at the Hotel Commodore on the evening of January 11, 1946.

Dr. Frary is the fortieth member of a group of distinguished scientists to receive the Perkin Medal. He is also the second scientist on the staff of Aluminum Company of America to be so honored. In 1911, *Charles Martin Hall* was awarded this coveted medal for his development of the present day process for the manufacture of aluminum.

Dr. Frary was born in Minneapolis in 1881, the son of Francis Lee and Jeanette Cowles Frary. He received his preliminary education in Minneapolis and was graduated from the University of Minnesota in 1905 with a B. S. degree in analytical chemistry. He received his Master of Science Degree the following year. After a year of study at the University of Berlin, he returned to join the teaching staff of the University of Minnesota, where he continued his research work leading to a doctor's degree which was conferred upon him in 1912.

Dr. Frary joined the staff of Oldbury Electrochemical Company in 1915 as research chemist. It was here that he developed the technique of producing phosgene, which led to his selection during World War I, along with Professor D. T. Demorst, to build and operate a phosgene plant at Edgewood Arsenal. At the close of the war, Dr. Frary was a major in the Chemical Warfare Service.

Prior to Dr. Frary's entrance into the army, he had been asked to become director of research of Aluminum Company of America, and he assumed these duties in December, 1918. Starting at New Kensington, Pa., with a small group of men which he had selected for his staff, he succeeded during the intervening years in building up Aluminum Research Laboratories to its present position of international prominence.

Of the many achievements with which Dr. Frary has been closely associated during his long aluminum career, some of the outstanding including the production for the first time of very pure aluminum (99.98+) by electrolytic refining, the production of pure alumina by electro-thermal processes, and numerous other metallurgical processes of importance. He holds some thirty United States patents, and is the author and co-author of numerous books and papers in the fields of metallurgical and chemical research.

In addition to being a member of the Society of Chemical Industry, Dr. Frary is a member and past president of the American Institute of Chemical Engineers and the Electrochemical Society. He is also a member of the American Chemical Society, the American Institute of Mining and Metallurgical Engineers, the Institute of Metals, and the Chemists' Club. He was the recipient of the Pittsburgh award at the American Chemical Society, Pittsburgh Section, in 1937, and in 1939, received the Edward Goodrich Acheson Medal of the Electrochemical Society.

Master Metal Finishers

"Electroplating Costs" was the subject of a talk given by *Adolph Bregman*, consulting metallurgical engineer and the executive secretary of the Masters' Electro-plating Association of New York, on Tuesday, October 23, at the Hotel Statler, Boston, at 8:00 P. M., before the October meeting of the Master Metal Finishers Association of New England according to the president, *Rosario A. Campisi*.

The meeting was preceded by a social hour at 6:00 P. M. and a dinner served at 7:00 in the Hancock Room of the Hotel Statler.

20th Exposition of Chemical Industries

Among the first of the post-war industrial expositions to be announced is the 20th Exposition of Chemical Industries, which is being organized for the week of February 25 to March 2 in Grand Central Palace, New York, lately occupied as an army induction center. The announcement made by *Charles F. Roth*, president of the *International Exposition Co.*, under whose management the show of raw materials, processing equipment and chemical products is to be held, has been received with such enthusiastic response that a large portion of the display space on three floors of the Palace has already been requested.

Coming at a time when industries are in the throes of reconversion the exposition will serve as an accelerator, providing opportunities for personal contact and business conferences between principals, technical staffs, manufacturers and professional consultants. Many new products and processes created by the war are expected to come out from under wraps and be applied to civilian operations, now that military needs no longer demand secrecy. Many other new methods and products, shelved during the war years, are emerging as by-products, intended to round out the economic formulas. To the stimulating influence of first-time disclosures will be added the substantial effect of exhibits of improvements by many of the most influential concerns in process equipment and chemical research fields.

The 20th Exposition of Chemical Industries will be commemorative of the first exhibit of its kind, which was organized during World War I, under circumstances somewhat similar to the present, when a meeting of manufacturers and users and a close-up view of the physical aspects of industrial chemistry were necessary to bring new plans into being.

Substantiating its successful background is an advisory committee of leaders in scientific and industrial undertakings, of which M. C. Whitaker, vice-president of the American Cyanamid Company, is chairman.

American Society for Metals

Plans have been completed for the first great post-war industrial show with the recent announcement of the *27th National Metal Exposition* to be held in Cleveland's big Public Auditorium from Monday, February 4 through Friday, February 8, 1946. Originally scheduled for October of this year, the event was moved back to February to avoid any interference with heavy wartime transportation demands, according to *W. H. Eisenman*, managing director of the Exposition and national secretary of the *American Society for Metals*, sponsor of the event.

"This industrial show will be the largest ever held in America," Mr. Eisenman said. "Because of the widespread advance interest in the Metal Exposition, the floor plans which have been mailed to previous exhibitors this week showed a greater area of exhibit space than any event of this type in the history of U. S. industrial shows.

"This interest in the Exposition indicates that manufacturers are ready for reconversion and eager for the opportunity to show the new machines, materials and processes that have been developed in war and to demonstrate their possibilities for high peacetime production," Mr. Eisenman continued.

"For the first time in four years," he added, "the Metal Show, as it is generally known in industry, will be a forthright effort on the part of exhibitors to sell their products."

Mr. Eisenman pointed out that the Exposition would again be held in conjunction with the National Metal Congress with the result that thousands of metal men will not only see all the new products in operation at Public Auditorium but will also have the opportunity to hear the outstanding research papers presented by scores of engineers and technical experts. Cooperating with the American Society for Metals in presenting the Metal Congress will be the American Welding Society, the Iron and Steel and Institute of Metals division of the American Institute of Mining and Metallurgical Engineers, and the American Industrial Radium and X-Ray Society. Many trade associations and industry groups will also meet in Cleveland during the week of this event.

News from California
By FRED A. HERR

Ernest W. Francis' "retirement" from the plating business lasted exactly two years and three months. In July, 1943, Mr. Francis sold the *Francis Electro-Plating Shop* which he had operated at 3431 South Main St., Los Angeles, since 1908, to *Ed. A. Meek* and *Percy G. Dermody*. He announced that forever more he would devote his time to fishing and looking after his property in Manhattan Beach.

By October of this year Mr. Francis couldn't bear looking another fish in the gills and returned to the fold as plating foreman for *Dodge, Inc.*, 401 East Sixth St., Los Angeles. The firm manufactures commercial Jewelry, trophies, hollowware, service pins, school and fraternity jewelry. The company, he reports, has installed a new 450 gallon silver solution and has on order a 1,000 gallon tank.

Concurrent with Mr. Francis' return to active plating, two other prominent figures in the Los Angeles metal finishing industry announced their retirement. Both were former officers of Los Angeles A. E. S.

Carroll C. McLaren, who served as plating room superintendent for the *Cannon Electrical & Manufacturing Co.* for many years, has achieved the Elysium dreamed about by all platers as they sweat over noxious solutions. Carroll is now a poultry rancher. He resigned from the Cannon Co. in August and has ensconced himself in sylvan retirement as the operator of a chicken farm near Corona, Calif., some 40 miles southeast of Los Angeles. He served as secretary-treasurer of the branch for two years.

With similar thoughts occupying his mind, but not yet ready to disclose the details, is *Don Bedwell*, past president of the branch, who, effective October 15, sold the *Bedwell Plating Co.*, 1344 West Slauson Ave., to *Ralph Mineo* and *Gus Brigantino*.

Mr. Bedwell was one of the pioneers in the industry in Southern California. His connection with plating dates back more than three decades. Before the war he was in charge of all the plating for the *Hallenscheid-MacDonald Co.* of Los Angeles.

Mineo and Brigantino have announced they will operate the shop under the name of *Southwest Plating Co.*

Calvin B. Morris, co-operator with *Walter A. Stallfort* in the *Morris Plating Co.*, 2382 American Ave., Long Beach, is streamlining his plant for post-war production by the addition of some $3,000 worth of new equipment. He is installing a 10-foot chromium tank, smaller brass, silver and copper tanks, a high-speed polishing lathe and miscellaneous smaller items.

The new equipment supplements the two zinc, two cadmium and two anodizing tanks and the tumbling barrels which the two partners acquired when they established the plant early in 1944.

Back as plating superintendent for Morris Plating Co. is *E. G. Richardson*, who worked for *Douglas Aircraft Co.* in Long Beach since 1939, and prior to that had been with *F. W. Francis* for 10 or 12 years.

Jack Raskin, formerly with the *Udylite Corp.*, Detroit, has been appointed chief chemist for *L. H. Butcher Co.*, Los Angeles, in charge of plating in the California area. He announced his intention of transferring membership from the Detroit to the Los Angeles Branch, A. E. S. Mr. Raskin addressed the annual educational session of Los Angeles Branch when he was a member of the technical staff of Udylite several years ago.

Among plating shops that have no serious reconversion problem are the plants operated by film studios. *John Bowman*, plating foreman for *Paramount Studios*, told this writer some of the "secrets" of movie studio plating at a recent dinner meeting of Los Angeles A. E. S.

The metal finishing department of Paramount's Hollywood studio is 30 x 40 feet in area. Bowman handles all plating and exercises general supervision over his two assistants, who concern themselves largely with polishing. The shop contains ten solution tanks. Most frequently used solutions are copper, brass and gun-metal, the latter for work on camera legs and camera parts.

All articles handled in the shop are "props" used in films or in studio operation. In techni-

color pictures, for instance, all building hardware, such as door knobs and hinges, must harmonize in color with the general scheme of the set. Bowman's job is to plate such items to a specified shading.

One of his novel jobs was silver plating a six-inch high "Oscar" which *Bing Crosby's* youngsters had made for him out of wax when Bing's name was mentioned as a candidate for the 1944 Academy Award. Bing liked the wax model so much that he had it cast in white metal and mounted on a pedestal. Bowman was called upon to silver plate it. The Crosby kids had had the wax "Oscar" made as a joke on their dad, but the joke back-fired when Bing actually came through as the Academy Award winner in 1944.

Alleviation of the shortage of plating shop help, which independent shop owners of the Los Angeles area had looked for with the release of large numbers of platers and polishers by war plants at the war's end, had not yet materialized as this was written in mid-October.

Many independent plating plants in Los Angeles are still short of competent platers and polishers. Hundreds of employees of metal finishing departments of defense plants have been laid off, but there appears to have been no tendency on the part of this personnel to trek to the independent plating shops in great numbers. One shop owner explained it thusly:

"The men laid off when the war ended are flush with money. They do not want to go to work immediately. Many—I would say the majority—are taking a vacation, and it may be weeks before we will be able to fill our needs."

Another aspect of the shop personnel problem was cited by a veteran independent operator of Los Angeles. He pointed out that few of the men released by defense plants, particularly the larger plane factories, are all-around plating shop men. The nature of the procedure in the big defense plants precluded their getting experience in more than one or two types of work, he said. In the big defense plants an employee was assigned to one task —buffing or polishing, for instance—and was kept at that work throughout the years he worked in the plant. Unless he had previous experience in plating, he knew nothing about any other operation than the one he was assigned to when he left the defense plant.

This situation has caused a number of Los Angeles independent plating shop operators to establish training schools for shop personnel. An experienced plater is assigned to supervise the work of several men and teach them plating shop technique from one operation through another. One shop in October had a class of five men learning buffing and another group of five undergoing training in grinding.

A problem which aggravates the situation, one shop owner pointed out, is that as soon as some of such tyros have absorbed a little knowledge about plating, they decide that they know enough to open their own shop.

Kelite Products, Inc., Los Angeles, manufacturers of cleaning compounds, have an-

nounced the appointment of *G. E. Jackson* as regional manager in the Oakland-East Bay area of the San Francisco district, where he served as a Kelite representative for a number of years.

James V. Winkler has been added to the staff of *Dow Chemical Co.* as development engineer for magnesium on the West Coast. He was formerly in charge of experimental engineering at the Dow Co.'s magnesium fabrication laboratory in Bay City, Mich.

Hunter Nicholson has been appointed Los Angeles factory manager for *Kelite Products, Inc.* In his new post Mr. Nicholson will concern himself chiefly with factory methods and controls and improvement of production techniques. He was formerly associated with such outstanding firms as *American Potash & Chemical Co.*, the *Dicalite Co.*, and *A. R. Maas Chemical Co.*

Ferro Enamel Corp. of Cleveland, O., has acquired a tract of land at 5091 South Riverside Drive, Los Angeles, as the site of a new branch manufacturing plant on which construction will begin as soon as building restrictions permit. It will be used for production of porcelain enamel frit and synthetic enamel industrial paints, and storage of clays, oxides, chemicals and driers.

New Literature

Apprentice Training for Returning Servicemen

In reply to the thousands of inquiries from men in service for information on apprenticeship, a comprehensive booklet on the subject has been prepared especially for their guidance by *Apprentice-Training Service*, U. S. Department of Labor. This booklet, entitled "*Apprentice Training for Returning Servicemen*," has been written in collaboration with representatives of the educational branches of the War and Navy Departments, and the Veterans Administration.

While the booklet is designed primarily for the men still in the services, it is of equal value to those already released from service, and also to employers and labor organizations, especially in gaining a clear understanding of the veterans legislation as applied to ex-servicemen who are employed as apprentices.

Included in the information contained in this booklet is an explanation of the financial benefits of the veterans legislation which supplement apprentice wages, qualifications required of veterans for these benefits, as well as for apprentice training, procedure to follow, application forms and experience records needed. Among the other data presented is a list of over 300 skilled trades in which workers are trained through apprenticeship and ten major points which identify a bona fide apprenticeship program.

Copies of this booklet may be obtained by writing to Apprentice-Training Service, U. S. Department of Labor, 1778 Pennsylvania Ave., N. W., Washington 25, D. C.

Manufacturers' Literature

Coloring and Blackening

"*Enthone Ebonol Coloring and Blackening Processes for Metals*" is an 8-page illustrated booklet in color describing coloring processes for copper and copper alloys and blackening processes for zinc and steel.

Copies may be obtained by writing to The Enthone Company, Department MF, 442 Elm St., New Haven 2, Conn.

Automatic Plating Machine

The *Udylite Corp.*, Dept. MF, 1651 E. Grand Blvd., Detroit 11, Mich., has published a folder describing a compact full automatic plating machine adaptable to 80% of all quantity plating jobs. Features counter-balanced hydraulic tank transfer control, versatile work carrier mechanism, standard replacement parts.

Copies may be obtained by writing to the company at the above address.

Chain Belts

An eight page folder on Baldwin-Rex Roller Chain Belts is being distributed by the Baldwin-Duckworth Division of *The Chain Belt Co.* A detailed description of the roller chain features is presented. This, together with a table of specifications of the more popular sizes with their list prices

akes this folder a handy reference piece. copy can be obtained by requesting *Bulle- No.* 45-1 from Baldwin-Duckworth Divi- on of The Chain Belt Co., Dept. MF, Springfield 2, Mass.

Business Items

Dr. Roy E. Heath

Dr. Roy E. Heath now heads the Indus- ial Sales Department of the J. B. Ford ivision of *Wyandotte Chemicals Corp.* Dr. eath, who assumed his new duties Novem- r 1, will be associated with *W. M. Cole*, rmer head of the department, who is re- ining his connections with the company r an indefinite period. Mr. Cole is now arting his own business in a field in no y connected with metal cleaning or in- strial finishing.

Dr. Heath is a graduate of Albion Col- e and obtained his Ph.D. degree from estern Reserve University where he was a ational Carbon Research fellow working inorganic and electrochemistry. Follow- g one year as lecturer in chemistry at estern Reserve University and two years instructor in chemistry at the University Wisconsin, he joined Wyandotte Chemi- ls Corp. as a market research executive ttached to the Sales Department.

Late in 1943, Dr. Heath was granted a ave of absence to join the Metallurgical aboratory of the University of Chicago to fundamental chemical research on one hase of the Atomic Bomb Project. He re- rned to Wyandotte Chemicals Corp. in the all of 1944.

Dr. S. C. Ogburn, Jr., manager, Research and Development Department, *Pennsylvania Salt Manufacturing Co*, Philadelphia, Pa., announces the following additions to the Research and Development staff:

Dr. E. B. Gunyou, formerly with Production Division, U. S. Army Service Forces and Liaison Officer to Chemicals Bureau, WPB, has been appointed assistant to the manager of Research and Development Department. Prior to his army service, he served as development engineer for Grasselli Chemicals Department of duPont Co. Dr. Gunyou will be located at the company's general offices, 1000 Widener Bldg., Philadelphia.

Mr. Murray Zakheim, chemist at Defense Plant Corp., Cornwells Heights, Pa., operated by Pennsylvania Saft Manufacturing Co., has been transferred to the Research and Development Department. He will be associated with the agricultural chemicals group at their Whitemarsh Research Laboratories.

Marshall B. Taft, formerly of the Aero Division, *Minneapolis-Honeywell Regulator Co.*, has been made assistant to *Henry F. Dever*, president of the *Brown Instrument Co.*, Philadelphia industrial division of the Honeywell organization.

Mr. Taft was for three years administrative assistant to the vice president of the Aero Division in Chicago. Prior to that time he was practicing law in Minneapolis. He is a graduate of the University of Minnesota.

The *Hanson-Van Winkle-Munning Co.*, of Matawan, N. J., announces that *Paul R. Cutter* has joined their staff as an electrochemist.

Mr. Cutter received his primary and secondary education in Hugoton, Kansas. He received his B. S. in Chemistry from the Panhandle A. & M. College, Goodwell, Okla-

Paul R. Cutter

homa, and his M.S. in Physical Chemis... from the Oklahoma A. & M. College, S... water, Oklahoma. He has had broad ind... trial experience in chemical control and ... search. He previously was Assistant Ch... Chemist of Consolidated-Vultee Aircr... Corp., Fort Worth, Texas.

Mr. Cutter will work on special elect... chemical processes for the H-A-W-M Co.

James Berry, veteran General Motors s... executive, has been appointed vice-presid... and treasurer of the *Tanner Chemical C...* Ferndale, Mich.

Until June 1st of this year, Mr. Berry w... Detroit zone manager of GM's Oldsmob... Division. During 1944 he served as presid... of the General Motors Club of Detroit.

Mr. Berry will direct sales for the Tan... company, which produces "Tannerite," a r... proof coating for metal surfaces.

Dover Industries, Inc., announces the st... of operations at its plant located at 2929 ... Campbell Ave., Chicago 18, Ill. This is ... new enterprise which was organized to ... manufacturing and jobbing of metal artic... requiring plated finishes. The company's ... ecutives have each had from ten to twe... years of experience in the metal finish... industry. *L. D. Jense*, formerly vice-presid... of *Chromium Corp. of America*, is presid... *O. A. Wettlaufer* and *E. L. Berkenkot...* formerly sales manager and plant supe... tendent, respectively, of Chromium Corp. ... America, are vice-presidents, and *K. ... Schwartz*, formerly vice-president of *Uni... Chromium, Inc.*, is treasurer.

An industrial site with 45,000 square f... of available space has been acquired. Mode... and complete facilities have been installed ... hard chromium plating and heavy nickel pl... ing on equipment weighing up to 5 tons a... 22 feet in length. In addition, equipment ... available for cadmium, zinc, tin, lead, silv... copper, nickel and chromium plating to ex... specifications. The company will also ... Alumilite finishing and Vapor Blasting.

Al Baker
Chief Warrant Officer, U. S. N.

Chief Warrant Officer *Al Baker* has been released from the U. S. Navy after having been in service for over three years. Al, as he is familiarly known in the industry, saw seven months service in the Aleutians and thereafter, was stationed at Treasure Island, San Francisco, California.

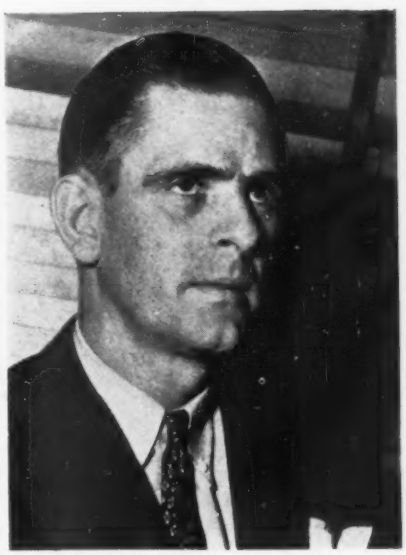
He has resumed his former position as Treasurer and Supervisor of Sales with the *A. E. Baker Company*, 143 Sidney Street, Cambridge 39, Mass., distributors of electroplating and polishing equipment and supplies.

The Industrial Oven Engineering Co. of Cleveland has opened a branch office in Chicago, located at 332 South Michigan Ave. This firm designs and manufactures all types of ovens and oven processing systems for temperatures up to 1000° F., specializing in complete coating and impregnating systems for wire, cable, rope, tape, textiles, rubber, synthetics, and other continuous materials.

In charge of the Chicago office are *H. W. Munday* and *F. T. Greaves*, both graduate engineers and specialists in industrial heating problems. Mr. Munday is a director of the Armour Research Foundation and a trustee of the Illinois Institute of Technology.

Robert D. Becker was recently appointed manager, Utensil Division of the *Reynolds Metal Co.*, according to *W. G. Reynolds*, vice-president and general manager of the Parts Division. Mr. Becker replaces *M. E. Horn*, recently resigned.

Prior to coming with Reynolds Metals five years ago, Mr. Becker was associated with the Stewart Dry Goods Co., a Louisville outlet of the Associated Dry Goods Corp. During the past five years Mr. Becker has served in varying capacities in both Foil and Parts Divisions of Reynolds Metals, being one of the original members of the latter. For the past three years he has been aircraft industry manager for the Parts Division, during which time the division's entire effort was devoted to expanded in the fabrication of aircraft



Robert D. Becker

detailed parts.

The Utensil Division headquarters will be maintained at Reynolds Plant No. 14, 2000 South Ninth St., Louisville 1, Ky.

After his appointment Mr. Becker announced that the greater part of the division's rapidly expanding production of aluminum kitchen utensils would be merchandised through recognized department store and jobber channels. The remainder would go through chain store outlets under existing agreements. He went on to say that additional items are being brought into the line as quickly as manpower, tooling and equipment problems make possible.

W. I. Gallaher, executive sales manager of *Pittsburgh Plate Glass Co.*, Columbia Chemical Division, announces the appointment of *R. M. Simpson* as sales representative for the Chicago territory. Mr. Simpson will be located in the Chicago Office at 1721 Tribune Tower Building, and will represent

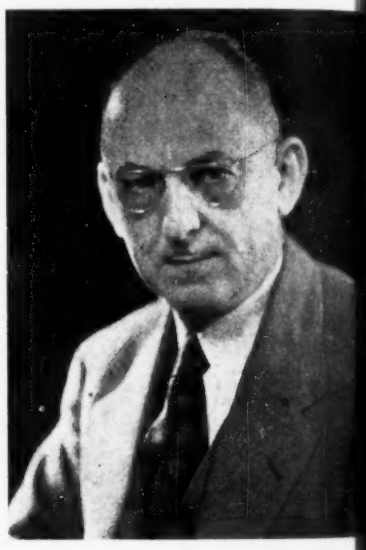
the company on the sale of alkalies, li chlorine, and related industrial chemi He began with Pittsburgh Plate in S tember, 1944.

He graduated from Deerfield Acad Deerfield, Massachusetts, and received A. B. degree in chemistry from Cornell U versity, Ithaca, N. Y.

Appointment of *Robert H. Boyer* as engineer was announced today by *The born Manufacturing Co.*, of Clevel world's largest manufacturer of brushes industry.

Mr. Boyer, who attended Sheffield entific School of Yale University, will sist Osborn salesmen in studies of the plication and use of power brushes.

In addition to his technical training, Boyer brings to Osborn 33 years of executive experience gained with Gen Electric, The Chicago Pneumatic Tool The Kent Co., of Rome, N. Y., Gen Floorcraft, Inc., of New York, and the



Robert H. Boyer

lard Company. In his latest connection fore joining Osborn, Mr. Boyer was eng in the inspection of precision equip used in Bullard's manufacturing operat

Mr. Boyer plans to make Cleveland residential headquarters.

Harold Narcus, formerly connected the *Industrial Chromium Corp.* and *Pl Processes Corp.* of Holyoke, Mass., ha signed from these companies to start a to be known as *Electrochemical Indus* This plant will be located in Worce Mass., and will specialize in the platin plastics and other non-conducting mate A consulting service to the plating and tics fields will also be offered.

Mr. Narcus, widely known in the el plating and plastics fields has written se technical articles on these subjects. have appeared in *Metal Finishing*. He also presented papers before branches o *American Electroplaters' Society* throug the country and gave a paper before Cleveland Convention of this Society in

1944. A paper on the electrodeposition of metals on plastics was given by him at the Fall Symposium of the *Electrochemical Society* in New York City in October.

He is a graduate from Worcester Polytechnic Institute in 1934, with a degree in

Harold Narcus

chemistry and is a member of the American Electroplaters' Society and the Electrochemical Society.

Promotion of Douglas Charters to the position of Assistant Manager for the company's expanded southwest territory is announced by *Ray Sanders*, General Manager, *Turco Products, Inc.*

"Doug," as he is familiarly known throughout the San Joaquin Valley, has been a member of the Turco organization for nine years and his experience as Field Service Engineer provides excellent back-

Douglas Charters

ground for his new duties in the Houston, Texas, District Office.

Mr. Charters pioneered in establishing Turco's production line overhaul procedures for the maintenance of military and training aircraft in many of the Army Air Force Depots. In addition, he has continued to handle civilian accounts, serving every major industry of Northern California, and is well qualified to render assistance in solving the specialized problems of civilian

accounts during this era of reconversion.

Mr. Charters will serve under the direction of *Mr. V. O. Poole*, District Manager of the Houston Office.

Phil J. Ritzenthaler, formerly technical director of *Milwaukee Plating Co.*, has resigned from the company to organize the *Plating Engineering Co.*, Milwaukee, Wis., to more fully carry on his activities with heavy nickel coatings, as well as electroforming. Mr. Ritzenthaler is the inventor of the Ato-Bond process for depositing highly adherent nickel coatings on a wide variety of basis metals. This process was extensively used during the war to salvage a large variety of war parts, such as breech rings, gun barrels, gun and truck axles, shafts, etc. In electroforming Mr. Ritzenthaler expects to manufacture various types of molds, such as low cost plastic dies, precision foundry patterns, etc. Mr. Ritzenthaler also plans to do consulting work on finishing problems in the Milwaukee area.

A graduate in Chemical Engineering from the University of Wisconsin in 1932, Mr. Ritzenthaler became associated with Cutler-

Phil J. Ritzenthaler

Hammer, Inc., large manufacturers of electrical controls. Originally in control work in the plating department, he was later put in technical charge of all finishing activities of the company, which included plating, enameling, soldering, and corrosion problems. During the war, he helped to organize Milwaukee Plating Co. to do the surplus plating which the war brought about, as well as to start his work with heavy nickel.

Two new additions to the sales staff of *ILG Electric Ventilating Co.* have been announced by *P. D. Briggs*, vice-president in charge of sales.

R. E. Pauling has been named manager of the Tulsa, Okla., office. A self-educated man, Pauling has had long experience in the heating and ventilating business. Starting in a plumbing supply company in Kansas City in 1917, Pauling left to enter the army. Upon his discharge, he spent a few months with his old employer, then started a twenty year period of service with the U. S. Radiator Corp. From 1939 until his present ILG con-

rection. Pauling has been traveling the mid-west for the Illinois Malleable Iron Co. of Chicago. He served as president of the Oklahoma Chapter of the American Society of Heating and Ventilating Engineers.

R. E. Pauling

Marion A. Elliotte has been appointed to the staff of the Detroit, Mich., office. He, too, has had many years experience with closely allied lines. After specializing in mechanical engineering at the University of Pennsylvania and Drexel Institute, Elliotte entered the employ of the Humphrey Water Heater Co., where he served as sales manager. He then became plant manager of the Detroit Brass Malleable Works, and, immediately preceding his ILG appointment, was employed in sales engineering and product development department of Marine Products Co.

Marion A. Elliotte

According to Briggs, these appointments represent steps being taken by ILG to bring sales engineering assistance in the forty branch offices up to prewar manpower levels. It is anticipated that new offices will be opened within coming months.

ODDS and ENDS

ire and Learn Dep't:

Some types of finely divided carbon black have a surface area of *acres* per pound.

Addition of titanium to steel in amounts sufficient to react with carbon to form titanium carbide, permits application of one coat enamel finishes without use of a ground coat and elimi- blisters and pits.

ravel Notes:

A suitcase has been patented with a back and head rest for vellers who must sit on the floor these days. May come in handy the next A. E. S. Conference! Incidentally, now that the war is r, can we start calling it a *Convention* again without casting reflec- upon anyone's patriotism?

The ancient Chinese, they tell us, had an "uphill" mile and a wnhill" mile. They logically contended that it was harder to walk hill so the uphill mile should be shorter.

A thing to look forward to in the near future will be the absence so many women waiting at the corner for the next bus. Will some- tell us why a woman will wait 15 minutes for a bus and then, until after she gets in and blocks the entrance, will she begin to mble in her bag for the coin? It will also be a relief to many n, not because they won't have to get up anymore to give a lady a t, since they never did anyhow—but now they won't have to try act preoccupied with their paper or the scenery, until the female anders step on their toes.

(What's gone and past help, should be past grief.—*Shakespeare.*)

Slips That Pass:

A laboratory news bulletin advises that greater safety for workmen may be expected by the substitution of ethylene diamine *for the highly toxic cyanide hitherto used* in the (chromium) plating bath. We will agree that cyanide is highly toxic, but anyone who claims that it is used for chromium plating can get better than 6 to 5 from a plater!

Photo caption in an engineering journal: ". . . *ferric oxide of iron* . . . ." Is there a ferric oxide of some other metal besides iron? This is like the fellow who speaks about *stannate tin* solutions. No matter how it's pronounced, we say it's redundant (we could have said *pleonastic*, but our friends would still remain unimpressed)!!

Discussing silver plating in a recent issue of one of our contemporaries, the author remarks: "The current is held at 5-10 amperes and 2 volts per square foot of work." Also: "In 10 minutes, the plate will be 0.0003" thick and after *50* minutes, a full 0.001 inch thick." The difference is obtained, no doubt, by varying the voltage per square foot!

Government Surplus:

Glancing down the list of surplus property available in a recent government listing, we noted under the heading "Animal Products, Inedible," the item "*worms*." Honest, that's exactly what it stated! Reminds us of the one about the G. I. from Flatbush, who, while stationed at a camp in Texas, came back from a walk one day with a set of enormous rattlesnake rattles. When asked where he got them, his reply was: "I took 'em off'n a woim!"

What Is Plating?

To the better known definitions, namely the coating of a material with a metal and the shoeing of horses, we add the knitting of cotton and rayon yarn so that the rayon is predominant on the outside and the cotton on the inside. It has been said that plating is a big field. Perhaps our customers know some other definitions, in which case we will be glad to add them to the collection.

EQUIPMENT FOR NEW ENGLAND

MAC DERMID INCORPORATED is the established sales and service headquarters in New England for many of the most reputable metal cleaning, finishing, and plating equipment manufacturers. Our Service Engineers are equipped and trained to help you determine the most desirable metal cleaning, finishing, and plating equipment for your individual needs.

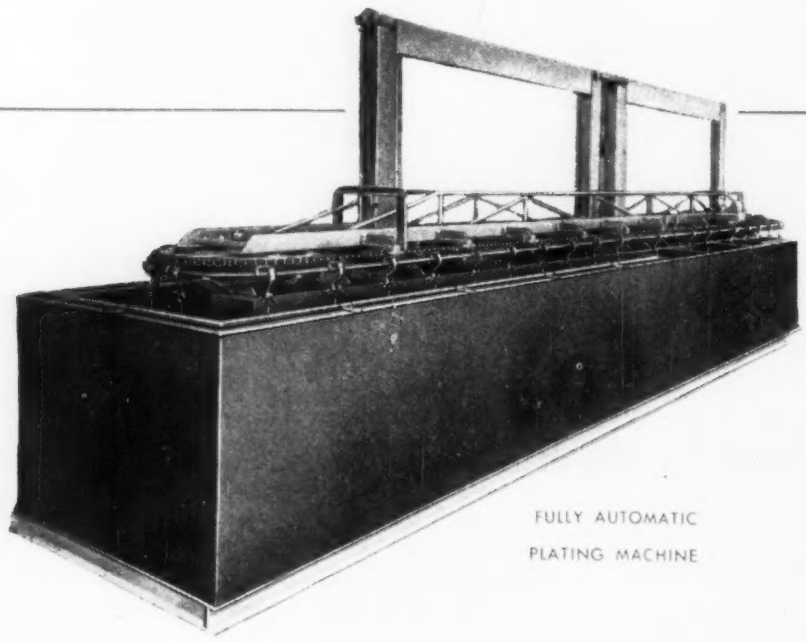
Write for Service

A qualified Technical Service Engineer will be pleased to call at your convenience to describe and demonstrate where possible, the newer, more advanced types of metal finishing equipment now available. Ask him for his suggestions for the improvement of your complete cleaning-finishing-plating cycle. His vast experience and knowledge of the newer processes and modern equipment could be invaluable . . . also be sure and consult him concerning your smaller equipment and supplies—possibly many of the hard to get items that you have been looking for are now available and stocked in our Waterbury warehouses.

Fully Automatic Plating Machine

Compact, versatile, and low priced plating machine designed to fill the gap between the still tank and *specially built* full automatics. Compactness, easy movability, and low cost encourages its use in multiple units or batteries, affording greater flexibility of usage.

PLACE YOUR ORDERS EARLY



FULLY AUTOMATIC
PLATING MACHINE